PART II.

AGRICULTURAL DESCRIPTIONS

OF THE

COTTON-PRODUCING COUNTIES

OF

TENNESSEE.

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In the descriptions which follow, the counties are arranged in groups according to the natural divisions to which they severally, either wholly or predominantly, belong. Each county is noticed separately and as a whole. Where a county lies in two divisions, its name is given in both; but it is described under the head of the division to which it chiefly belongs, and reference is made to this. The asterisk (*) indicates that the description of the county to which it is attached appears under some other regional head. It may be stated here that in Part I of this report many counties have been incidentally noticed or partially described. To such notices or descriptions references are made whenever it may be deemed desirable. Under each county head the statement of woodland refers to the original condition of the land before it was cleared and brought into cultivation.

Following the descriptive notices of the several counties are abstracts from such parts of the reports of correspondents as refer to natural features and production. In many instances abstracts from two or more persons who describe the same region have been combined. The substance of the remainder of the reports, referring to agricultural and commercial practice, will be found in Part III, at the beginning of which is also a complete list of correspondents, with their post-offices, and the names or location of the particular regions which they severally discuss.

ALLUVIAL PLAIN OF THE MISSISSIPPI RIVER.

This region embraces the whole of Lake, large parts of Dyer* and Lauderdale,* and small parts of Tipton* and Shelby* counties.

LAKE.

Population: 3,968.—White, 3,274; colored, 694.
Area: 210 square miles.—Woodland, all.
Tilled lands: 34,666 acres.—Area planted in cotton, 3,249 acres; in corn, 14,730 acres; in wheat, 1,608 acres; in oats, 108 acres; in tobacco, 5 acres.
Cotton production: 2,412 bales; average cotton product per acre, 0.74 bale, 1,059 pounds seed-cotton, or 353 pounds cotton lint.

Lake is the only county in Tennessee wholly within the alluvial plain of the Mississippi river. It lies compressed between the Mississippi on the west and Reelfoot lake on the east. Its area is long and narrow, having a length of 23 or 24 miles and a width varying from 3 to 11 miles. There are no uplands proper, but as a general thing the lands are higher along the Mississippi, becoming lower as we approach the lake. About one-third of the county is entirely above overflow from the river. Of the remainder, one-third seldom overflows, and only in very high water, and this is said to be the most productive part. The northern third of the county, the wider and better part, is mostly above overflow and nearly all under cultivation. Two-thirds of the middle part is also under cultivation, there being good sections of land both on the Mississippi and the Reelfoot sides. Alternating belts of timber and cultivated lands extend longitudinally through the southern part, and a cultivated strip is usually found near the river and parallel with it. Much of the southern end, comparatively, is subject to overflow. The same may be said of a strip along Reelfoot lake in the northeastern corner of the county. (See also description of the region.)

The soils are described as black and yellow, alluvial, and sandy and mixed loams. Alternating with these are buckshot clays. The general growth is cottonwood, sweet gum, ash, oak, hickory, pecan, elm, hackberry, walnut, box-elder, red maple, mulberry, and cypress, with papaw and spicewood undergrowth. Shipments are made to Memphis, New Orleans, or Saint Louis, by steamboat, at from $1 to $1 50 per bale.

ABSTRACTS FROM REPORTS.

C. M. PEACOCK AND DAVID WAGONER.—The soils of the county are the (1) black alluvial; (2) the black sandy loam; (3) the buckshot and light sandy. The first is the chief soil, forming one-fifth of the land, and occurs at intervals over the county. It is from 1 foot to 10 feet in thickness, very porous, readily drains itself, and is easily cultivated. The crops produced are cotton, corn, wheat, oats, Irish and sweet potatoes, and peanuts, to all of which the soil is well adapted. One-fifth of the tilled land is planted in cotton. Plants grow to a height of from 4 to 8 feet, that not exceeding 5 feet being the best. Wet seasons and too much plowing cause the plant to run to weed. The remedy is less and shallow plowing. The product of seed-cotton per acre on fresh land is from 1,200 to 1,500 pounds, 1,780 pounds being required for a 475-pound bale. Staple, good ordinary. After twelve years' cultivation the yield is from 2,000 to 2,500 pounds, requiring 1,660 pounds for a bale, and the staple is much better than that from fresh land. The troublesome weeds are cocklebur, smart- and careless-weeds, and crab-grass. No land of this kind lies turned out.

The *black sandy loam* aggregates one-third of our lands, and occurs scattered over the county, and at a depth of 3 feet is black dirt or white sand. One-fifth of the cultivated land is in cotton, which grows to a height of from 5 to 10 feet, the lower the better. In wet weather the plants are kept down by plowing but little and by cultivating with the hoe. Seed-cotton product on fresh land is from 500 to 800 pounds per acre, requiring 1,900 pounds for a 475-pound bale, rating as good ordinary. After twelve years' cultivation the yield is from 1,800 to 2,000 pounds, of which 1,660 pounds are required for a bale, the staple being much better than that from fresh land. Weeds same as above.

The *buckshot soil* constitutes one-fifth of the lands, and exists in small spots over the county; thickness, 5 feet. This soil is not easily tilled in wet seasons, and is hard to manage in dry. It is best adapted to corn, and very little cotton is planted. Cotton attains a height of from 2 to 4 feet, the latter being the most productive. The seed-cotton product on fresh land is from 800 to 1,000 pounds, and after ten years' cultivation 1,500 pounds. The weeds are foxtail and cocklebur.

R. S. BRADFORD.—The uplands are very level and rich, and almost all are fit for cultivation. The chief cotton soil is a black, moderately stiff soil, which comprises from one-half to two-thirds of white sand, the remainder being clay. Pebbles are met with at a depth of 35 feet. The chief crops are corn and cotton, about one-twentieth being planted in the latter, but it is well adapted to either. The yellow sandy soil is about one-fifteenth of our lands, and occurs throughout the county. One-twentieth is planted in cotton, to which it is well adapted, as also to corn. The buckshot clay forms about one-fourth of the lands, and occurs throughout the county. It is best adapted to cotton, in which one-twentieth is planted. All these soils have the same growth of timber.

R. M. DARNALL (northwestern part of the county).—This region is continuous with Madrid Bend, in Kentucky. The higher lands are alluvial, and are elevated above overflow. They are so surrounded by the river that cotton is often protected from frost when in other localities, even farther south, it is killed. The kinds of soils are: (1) White sandy; (2) yellow sandy; (3) putty or buckshot clay. The chief is the white [gray] sandy soil. One-twentieth of our land is of this kind, and occurs from Cairo, Illinois, to Memphis. Three-fourths of the subsoil of Lake county is underlaid, in some places at 15 feet, by gravel. The soil is easily cultivated in wet or dry seasons, and two-thirds of it is planted in cotton, the other chief crops being corn and wheat, but it is well adapted to any crop. Cotton grows from 3 to 7 feet high, but is best at 5 feet. On fresh land, unless the season is dry, the plant goes to weed. It produces about 1,200 pounds of seed-cotton, requiring 1,900 pounds for a 475-pound bale. Land twenty years old produces a bale of lint to the acre. The lands are level, and there is no washing.

L. DONALDSON (Mississippi bottom, near the margin of Reelfoot lake).—The black clay (buckshot) with a substratum of sand forms one-half of our lands, and extends 2 and 3 miles in each direction. The subsoil is either a brown sand or black putty clay, not impervious. Tillage is generally easy, but difficult after wet springs followed by dry seasons. Crops are various. The land is best adapted to corn and cotton, and one-fourth of it is planted with the latter. The seed-cotton product on fresh land is 1,900 pounds per acre, 1,660 being required for a 475-pound bale. It rates as low middling and good ordinary. After ten years the product per acre is 1,600 pounds. On the mixed sand the product, after the same time, is 1,500, and on the sandy land 1,200 pounds per acre, the staple being the same as before. One-half per cent. only is turned out. Such land taken in again is better by 25 per cent.

J. W. FOWLER (between Reelfoot lake and the river).—The report agrees substantially with that of L. Donaldson.

DYER.

(See "The Bluff region".)

LAUDERDALE.

(See "The Bluff region".)

TIPTON.

(See "The Bluff region".)

SHELBY.

(See "The Bluff region".)

MISSISSIPPI ALLUVIUM (in part) AND BLUFF REGION.

This region includes nearly all of Obion county, and the larger parts of Dyer, Lauderdale, Tipton, and Shelby.

OBION.

Population: 22,912.—White, 18,841; colored, 4,071.
Area: 540 square miles.—Woodland, nearly all, excepting the area of Reelfoot lake.
Tilled lands: 109,857 acres.—Area planted in cotton, 7,259 acres; in corn, 45,005 acres; in wheat, 25,368 acres; in oats, 2,105 acres; in tobacco, 1,432 acres.
Cotton production: 4,225 bales; average cotton product per acre, 0.58 bale, 828 pounds seed-cotton, or 276 pounds cotton lint.

Previous to 1870 Obion was the most northwesterly county of the state. In the year mentioned a large part, all west of Reelfoot lake, was cut off to make Lake county, the old county thereby losing well-nigh all of its share of the Mississippi bottom, and its best lands. The lake was retained.

The county is in the main one of our most fertile areas. Uplands predominate, and their soils are based chiefly upon the formation we have called the loess. The description given of this formation and of the soils of the Bluff region on page 17 of this report applies to this county, and the reader is referred to what is there said. I note here that the loess is underlaid by gravel and sand, and these again by clayey beds. Hence it happens that the subsoils of the uplands are often underlaid, at greater or less depths, by gravel or sand, or both, and further, that the lower lands often have a clay basis. The very fine ashen or yellowish loess is frequently considered popularly as clayey matter, and is so called.

The uplands are often rolling, but supply extensive level tracts. Approaching the bluffs in the western part of the county they become more or less hilly. A narrow alluvial tract lies along the eastern border of Reelfoot lake, between the lake and the foot of the bluffs. This land is rich and fertile, and some of it is subject to overflow. That above overflow yields good crops of cotton, and upon all of it farmers manage to raise heavy crops of corn. The timber is cypress, ash, walnut, and cottonwood, with an undergrowth of cane. Alluvial lands or bottoms, subject to overflow, occur on both sides along the Obion river and its forks, which traverse the southern part of the county. The bottoms often extend out a mile or two from the river. The soils are a thin, crawfishy clay, and support chiefly a growth of beech and cypress, with an undergrowth of cane. Outside of these are the second bottoms, above overflow, often supplying a level country with a rich and productive soil. The second bottoms rise gradually into uplands, together giving a belt of country of great fertility, and once remarkable for its heavy timber, great "poplars" and oaks, gum, beech, sugar-tree, and hickory, with cane and papaw beneath.

ABSTRACTS FROM REPORTS.

J. H. McDOWELL (continuation of abstract in Part I, region of Hoosier creek).—The lowlands are very level for 10 miles east and west by 8 miles north and south, and the soil is better adapted to cotton culture than is usual with sections so far north. While the seasons are short for cotton, the yield will compare well with points much farther south. The nature of the soil is such, especially on the uplands, as to force and hasten maturity. Yet this cannot properly be considered a cotton-producing region. Cotton in the bottoms runs too much to weed, and is often cut short by frost.

The chief soil, the light blackish upland, rests upon a heavy gray to light brownish-gray subsoil, which in turn is underlaid by sand and gravel at from 10 to 20 feet. The land is easily tilled, especially after the first breaking and harrowing. It is looser in dry seasons, and, if well drained, is early and warm. The chief crops are cotton and corn on the uplands, and corn, wheat, and tobacco in the lowlands, corn best suiting the soil. Cotton is planted in the proportion of one-sixth for the uplands and one-twentieth for the lowlands. The height attained is 4 feet, the most productive. It runs to weed in low wet lands. The seed-cotton product on fresh land is from 600 to 800 pounds, of which 1,660 pounds are needed for a 475-pound bale. After five years' cultivation the land (unmanured) yields from 800 to 1,200 pounds, requiring 1,545 pounds for a bale. The staple from the old land brings from one-fourth to one-half cent more, but there is no positive rule as to this. Some fresh lands yield a staple equal to that from old lands, while others in the same locality supply an inferior article. As to the yield per acre, I may state that it was last season (1879) far above the figures given in this report, the second-class lands running as high as 1,500 pounds, and the first, in favorable locations, occasionally as high as 1,800 pounds. The weeds are crab-grass and cocklebur in bottoms, crab-grass and smart-weed on uplands. About one-hundredth part of the uplands are "turned out"; none of the lowlands. Rest helps comparatively level land. The slopes are injured by washing, but the valleys are improved by the material thus brought upon them. A good deal of ditching has been done, the lands thereby becoming drier and warmer.

The *black loamy lowland* forms four-fifths of the lands in this region, and occurs over an area 8 by 10 miles in extent. Its growth is hickory, ash, gum, sassafras, walnut, red, white, black, and turkey oaks, hornbeam, box-elder, beech, and maple. It rests upon a gray clayey subsoil containing brownish gravel, underlaid by sand at from 10 to 20 feet, and readily drained. The land is easily tilled in wet or dry seasons, is late and cold, and is best adapted to corn, wheat, and tobacco. Only about one-fortieth part is planted in cotton.

B. W. HERRING (western part of the county).—The upland, the best for cotton and most used, is a light clay, mixed with some sand, ashen-colored or gray, making three-fourths of the lands. Its timber is oak, hickory, poplar, ash, and walnut. The soil, 12 inches thick, is underlaid by a light yellowish subsoil. The land is easy to till in dry weather, but difficult in wet. Its chief crops are corn, wheat, tobacco, and grasses. Not more than one-tenth part is planted in cotton. The weeds are rag-weed, cocklebur, white-top, and crab-grass.

J. S. MURPHY (northeastern part of the county).—The land in this section is termed ridge land, and is situated between Harris' fork and Obion river. We have substantially but one soil, known as gray soil. The entire section, excepting a small amount of glade, is of this kind. It extends 8 miles to the south and west and 15 or 20 miles to the north and east. Its growth is oak, hickory, dogwood, walnut, poplar, gum, elm, red-bud, and hazel. It is from 4 to 6 inches thick, and rests upon yellow clay. The land is productive, any kind of crop growing well. One-fifth of the land is planted in cotton, which grows from 2½ to 3 feet high, the latter giving the best yield. The seed-cotton product per acre is from 1,200 to 1,800 pounds, 1,600 pounds being required for a 475-pound bale. The staple rates as middling. I have gathered 1,600 pounds per acre from land after six years' cultivation. The staple from the older land is shorter and not so good. The weeds are hog-weed and crab-grass. I do not know that an acre of this land is "turned out".

DYER.

Population: 15,118.—White, 11,206; colored, 3,912.
Area: 570 square miles.—Woodland, all, excepting a few small lakes in the bottoms.
Tilled lands: 76,194 acres.—Area planted in cotton, 14,637 acres; in corn, 27,820 acres; in wheat, 11,820 acres; in oats, 1,961 acres; in tobacco, 364 acres.
Cotton production: 8,564 bales; average cotton product per acre, 0.59 bale, 834 pounds seed-cotton, or 278 pounds cotton lint.

Dyer county is not far from being equally divided between bottom lands and uplands. The western part lies in the alluvial plain of the Mississippi, while the eastern is high land pertaining to the bluff region. The reader is referred to what is said under these heads on page 15 for general characteristics. The Mississippi bottom is traversed by the Obion river, and as a whole is thinly settled. The interrupted strip of cultivated land along the Mississippi river has been referred to in Part I. Within the bottom the Forked Deer river, which runs westward into the Mississippi, is the boundary between Dyer and Lauderdale counties. Leaving the bottom of the Mississippi and entering the bottom lands proper of the Forked Deer, in Dyer county, the latter are found to have a sandy loam of great fertility, giving some of the best cotton-producing areas in the county. Other good alluvial lands are found along the tributaries of Forked Deer and Obion rivers. Bottoms, however, occur which are clayey, cold, and subject to overflow.

The highlands have a general elevation of from 100 to 150 feet above the Mississippi bottoms. They are frequently level, often undulating, but become broken when approaching the bluffs, where they end abruptly in a steep escarpment overlooking the great alluvial area to the west. The soil is a rich brown loam, based on loess, having had a native growth, as in Obion, of very heavy timber, poplar, gum, white oak, sugar-tree, ash, walnut, elm, and dogwood, with species of a smaller growth. These lands present an agricultural region of great interest, and among the best in the state.

Cotton is shipped to Memphis, New Orleans, or Cincinnati at $2 50 to $3, and by rail or by water to Memphis at $1 per bale.

ABSTRACTS FROM REPORTS.

(An abstract from L. M. Williams' report has already been given.)

C. H. PATE.—The alluvial and cultivated belt along the Mississippi river is interrupted at intervals, but extends for 75 miles up and down the river. It is a sandy soil from 18 to 20 inches thick, with a growth of cottonwood and sycamore. The subsoil with very few exceptions is sandy. The crops are cotton and corn, the soil suiting both. One-half the lands are put in cotton. The plants grow to 5 feet in height, and at that are most productive. Bolling is favored by topping or removing the bud in July. The seed-cotton product is 1,800 pounds per acre, requiring 1,600 pounds for a 475-pound bale. The product is about the same on old land, requiring 1,545 pounds for a bale. In the latter case the staple is one grade better. A vine known as the devil's shoe-string is a troublesome weed. No land is turned out.

A. HARRIS (east and northeast of Dyersburg).—We have two kinds of soils or lands: (1) dark loamy uplands, mostly cultivated in cotton, and presenting great uniformity; (2) light sandy soil of the bottoms, not so great in area, but better for cotton. The first and chief soil makes three-fourths of our lands, and occurs out of bottoms all over the county. It is from 6 to 12 inches in thickness, and rests upon a subsoil of reddish clay, which crumbles in water, and is liable to wash on slopes. The subsoil contains small pebbles in places, and is underlaid by sand. The soil is easily tilled, and is early, warm, and usually well drained. The crops are corn, cotton, tobacco, wheat, oats, clover, timothy, and red-top, all of which grow well. About one-fourth is planted in cotton. Cotton reaches a height of 4 feet, and is then most productive. It runs to weed in warm, wet weather, and through continuous cultivation. Plowing close to the cotton and throwing the dirt from the roots check the growth. The seed-cotton product is from 1,200 to 1,500 pounds, requiring 1,780 pounds for a 475-pound bale. The staple rates as low middling to middling. After ten years the product is from 800 to 1,200 pounds, requiring 1,900 pounds for a bale, the staple being shorter but finer. Weeds are cocklebur and careless-weed. Very little land lies "turned out". Such land, when manured and clovered, produces as well as ever. The soils wash on slopes unless prevented by circling. Some ditching has been done with good results.

The sandy soils of the bottoms make about one-tenth of the lands in cultivation. The growth is oak, hackberry, box-elder, gum, ash, and maple. The soil is best adapted to corn and cotton, one-third being planted in the latter. The cotton grows to a height of 4 or 5 feet, and at this is most productive. The seed-cotton product is from 1,500 to 2,000 pounds per acre, 1,780 pounds being needed for a bale. The change in the land and in the cotton produced is very small after a number of years.

D. C. CHURCHMAN AND SMITH PARKS (northeastern part of the county, covering about 10 miles square between the Obion and Forked Deer rivers, and waters of Reed's and other creeks).—But little of the bottom land is in cultivation. The uplands are undulating, from 6 to 12 inches deep, resting on a red clay subsoil, and are much alike in productiveness. The growth is poplar, ash, oak, and elm. Twice within my recollection has the cotton all been killed by frost on the 18th of September. The yield per acre depends much as to whether killing frosts come early or late in October. Our soils are a clay loam with some sand in them, and present no noteworthy differences. They are dark in color, and sometimes yellowish, and are underlaid by sand at various depths. The crops produced are corn, wheat, cotton, tobacco, and clover, with various grasses for hay. About a fourth of the land is put in cotton. It grows from 2 to 6 feet in height; 3 feet is a good height. Too much rain in July and August causes it to run to weed. To remedy this and to favor bolling some practice topping; others plow, throwing the dirt from the cotton. The seed-cotton produced on fresh land varies from 800 to 1,600 pounds per acre, of which about 1,780 pounds will pay toll and make a bale. The staple rates as low middling and middling. After five years' cultivation the land produces as well as at first if well circled. The troublesome weeds are cocklebur and crab-grass. Very little of the land lies turned out.

LAUDERDALE.

Population: 14,918.—White, 9,081; colored, 5,837.
Area: 410 square miles.—Woodland, all, excepting a few small lakes in the Mississippi bottom.
Tilled lands: 58,010 acres.—Area planted in cotton, 24,083 acres; in corn, 22,580 acres; in wheat, 3,889 acres; in oats, 1,375 acres; in tobacco, 58 acres.
Cotton production: 13,250 bales; average cotton product per acre, 0.55 bale, 783 pounds seed-cotton, or 261 pounds cotton lint.

Lauderdale county is approximately a square area, and lies between the Forked Deer river on the north and the Hatchie river on the south. Like Dyer, it is nearly equally divided between bottom lands and uplands. On the west

we have the alluvial plain of the Mississippi; on the east, the high plateau lands of the bluff region. The line of bluffs, the abrupt western limit of the high or plateau lands, runs in a nearly northeasterly and southwesterly direction through the middle of the county, dividing it as stated. The Mississippi alluvial portion has been sufficiently described by Mr. J. L. Lea, of Fulton, and Mr. J. C. Marley, of Ripley, on page 15 of this report, under the head of the Mississippi bottom region. The growth of the bottoms is cypress, gums, oak, sassafras, hickories, pecan, mulberry, hackberry, coffee-nut, walnut, cottonwood, willow, sycamore, and cane. Low bottoms or first bottoms, often cold and swampy, are found very generally along Forked Deer and Hatchie rivers.

The upland portion has the general features of the bluff region (page 17), and is of course much like the plateau portions of Obion and Dyer counties. It is limited on the north and south, respectively, by the bottom lands of Forked Deer and Hatchie rivers, and is traversed by a number of creeks, the most important of which are Cane, Coal, and Knob creeks. Between the streams are extensive tracts, both level and rolling, occasionally becoming hilly. Fertile second bottoms succeed these as we approach the first bottoms. The uplands were originally very productive and were preferred for cotton on account of its maturing earlier, and in many sections, where not too much worn, are still preferred. The second bottoms and the sandy first bottoms are usually rich and yield well, better than the uplands, but their crops are more in danger from early frosts. The native growth of the uplands is poplar, oaks, hickories, ash, beech, sassafras, some chestnut, and sweet and black gum.

Cotton is shipped by water to Memphis at 75 cents, to New Orleans at $1 25, and to Saint Louis at $1 per bale.

ABSTRACTS FROM REPORTS.

(Items from the report of F. T. Rice, of Durhamville, have been given under the head of "the Bluff region", in Part I.)

J. F. YOUNG (county generally).—Cotton on sandy lowlands matures as early as on the uplands, and since the uplands, though very productive when fresh, deteriorate greatly, the lowlands, even without sand, are more desirable for cotton and much more so for corn. We have two qualities of uplands, poplar predominating on the one and oak on the other. Both are productive when fresh. The poplar lands are considered the best. The kinds of soil under cultivation are: (1) Light mulatto soil on uplands or slopes; (2) dark loams of the second bottoms of the rivers and creeks; (3) sandy bottom soils of the Mississippi. The chief soil is the mulatto upland. About one-half of Lauderdale county is of this kind. It covers an area 20 miles long by 10 wide, varying in thickness from 6 to 12 inches. Its subsoil is tough yellow clay, baking hard when wet and exposed to the sun. By cultivation it gradually becomes like the soil, but is not so friable. It is nearly impervious when undisturbed; is underlaid by sand and gravel at from 10 to 20 feet, and is generally easily cultivated, except when wet. The chief crops are corn, cotton, wheat, and oats. Nearly one-half the land is planted in cotton, growing on comparatively fresh land to 4 and 5 feet, and at this height is most productive. Cotton runs to weed on rich and wet lands in wet seasons. Very shallow tillage may restrain the plant and favor bolling a little, but very little. The seed-cotton product per acre on fresh land is 1,000 pounds, requiring 1,660 pounds for a 475-pound bale. The staple is very good. After ten years' cultivation the product is from 700 to 1,200 pounds if the land is kept from washing by horizontalizing. In this case 1,660 pounds are also required for a bale, and the staple is about the same as the other, excepting on very poor land, when it is shorter. The weeds are crab-grass and cocklebur. Very little of the land lies turned out. Hilly or broken lands, when turned out, wash so badly that their restoration costs more than they are worth. The slopes wash readily, causing serious damage. The valleys are not injured much thereby, there being little sand in the washings. Considerable horizontalizing and hillside ditching have been tried, with satisfactory results when well done.

The *dark loams of the second bottoms* of Forked Deer and Hatchie rivers form a fifth of the lands, occurring in areas from a fourth to 1 mile or 2 miles in width, and from 5 to 10 miles in length. The natural timber is poplar, ash, red and white oaks, beech, hickory, hackberry, sweet gum, and dogwood. The soil is from 8 to 12, or in places 4 to 5 inches thick, and has for the most part a subsoil resembling that of the uplands, which is underlaid by sand and gravel at from 10 to 15 feet. It is later and colder than the uplands, especially where not well drained. The soil is best adapted to corn and cotton, and when thoroughly drained produces wheat well. One-half of it is put in cotton, which grows to a height of 5 or 6 feet. The seed-cotton product on fresh land is from 1,200 to 1,800 pounds, according to season, requiring 1,660 pounds for a 475-pound bale. The staple is equal to any. After ten years' cultivation the product is nearly as good as at first, and the staple about the same. The weeds on this soil are crab-grass, smart-weed, and cocklebur. None of it, to my knowledge, lies turned out. This land is generally nearly level, and does not wash badly. Some of it is rolling enough to be benefited by horizontalizing, but does not need hillside ditching. Parts of it would be benefited by underdraining, but very little of this is done.

The following special descriptions are given by other correspondents, in addition to the soils described above:

P. T. GLASS AND JOE L. LEA.—Cotton on the margins of rivers and lakes is protected from frost in the spring and fall by the waters. The first bottom soils of the Hatchie are clayey and cold; the second make a rank growth of cotton. The lands of this and the Mississippi river embrace clay and sandy loams and stiff buckshot clays.

E. R. OLDHAM AND I. A. LACKEY (eastern part of the county).—The uplands of Cane creek and its tributaries are undulating and rather hilly, but the soils are very productive. The bottom soil forms about one-fifth of the lands, and lies along the creek in strips half a mile wide. About half is planted in cotton, which grows to a height of from 4 to 5 feet, producing most when highest. The seed-cotton product on fresh land is about 1,400 pounds, and about the same after four years' cultivation.

F. T. RICE AND J. J. ALSTON.—The chief soil of the southeastern and southern parts of the county is the dark or mulatto upland, which is best adapted to cotton, yielding about 1,400 pounds of seed-cotton per acre on fresh land, or 500 pounds after ten years' cultivation. The troublesome weeds are crab-grass, purslane, Jamestown weed, cocklebur, and hog-weed. The dark loam soil of Lagoon and Williams' creeks, or second bottom, makes one-fourth of our lands. It reaches out 25 or 30 miles. The timber growth is tupelo-gum and cane. The subsoil is red clay, baking hard when exposed, and is underlaid by some sand-rock at from 20 to 35 feet. The tilling qualities of the land are tolerably good in dry seasons, but not good in wet. It is early and warm if well drained, and is best adapted to cotton, three-fifths of the land being planted in this staple. The height usually attained is 5 feet, the best at 6 feet. The seed-cotton product on fresh land is 1,600 pounds, 1,545 pounds making a 475-pound bale. It rates as middling. After ten years' culture the product is 700 pounds, the staple being slightly better. The weeds are cocklebur, purslane, and hog-weed. None of this land lies turned out.

The Hatchie bottom soil formes one-twentieth of our lands. It is a strip 2 miles wide and very long. The soil is 3 feet thick, with a red subsoil, under which is sand at from 15 to 20 feet. It is early and warm if well drained, and is best adapted to cotton, two-thirds of the land being planted in this staple. Cotton grows to a height of 5 feet, but is best at 6½ feet. The product on fresh land and the staple are as in the second kind. After ten years' cultivation it yields 1,000 pounds per acre.

(J. H. Flowers, W. W. Hurt, R. L. Halliburton, and J. C. Marley.—Their reports of the uplands and bottom lands are similar to those given.)

TIPTON.

Population: 21,033.—White, 10,482; colored, 10.551.
Area: 330 square miles.—Woodland, all.
Tilled lands: 100,666 acres.—Area planted in cotton, 38,429 acres; in corn, 32,379 acres; in wheat, 7,363 acres; in oats, 2,431 acres; in tobacco, 46 acres.
Cotton production: 21,415 bales; average cotton product per acre, 0.56 bale, 795 pounds seed-cotton, or 265 pounds cotton lint.

The greater part of Tipton county is upland, and is included in the bluff region belt. The line of bluffs forming the western termination of the uplands or plateau highlands strikes the Mississippi river below the mouth of the Hatchie, and, after bordering the river for several miles, and forming what is known as the second Chickasaw bluff, bears off toward Memphis, leaving a comparatively narrow strip of bottom, which has been estimated to average 4 miles in width. This, together with four islands, Nos. 35, 36, 37, and the one named Centennial, makes up the part of the Mississippi alluvial plain pertaining to Tipton. The parts of the islands in cultivation, presenting superior cotton lands, aggregate something more than one-seventh of their area (see page 14). The limited cultivated lands along the east bank of the Mississippi occur chiefly in two separate strips. Much of the alluvial plain within the county, as well as of the first bottoms of the Hatchie river, is subject to overflow.

The surface of the upland portion of Tipton county might be inferred by one knowing the characteristics of the bluff region belt. It is in general an undulating table-land, traversed here and there by creek valleys. In some parts it becomes hilly, especially as we go westward and meet the breaks of the bluffs. The fresh soils are generally dark brown, rich and productive, resting upon a yellowish or reddish, siliceous, and often compact subsoil. Dark alluvial soils lie at intervals along the creeks and branches. The second bottoms and gently sloping lands between the streams and the highlands present very fertile and important agricultural areas. Nearly all the lands in Tipton, except those of the low bottoms subject to deep overflow and some steep hills, are suitable for cotton culture. As compared with the total area, the southeastern part of the county lies in the belt of highest percentage of acreage in cotton.

Cotton is shipped to Memphis by rail at $1 75, and by water to Saint Louis or New Orleans at $1 per bale.

ABSTRACTS FROM REPORTS.

DR. W. H. HILL, S. P. DRIVER, AND J. U. GREEN.—The upland soil of Town creek and Big Hatchie river is a black loam. Some of the flats near the creeks and large branches have patches of a white gravelly soil; the balance is a rich loam. Cotton in the valleys and lowlands is liable to injury by frost. The land is too rich and the cotton runs too much to weed. Our remedy is to plant early, and generally to top the cotton, checking the growth. The uplands are preferred for cotton, as they are more easily cultivated, are better drained, which is a great item, and the crop matures earlier. The kinds of soils are: (1) Clay loam uplands; (2) black loam of Town creek and Hatchie river above overflow; (3) whitish gray or crawfishy. The chief soil is the clay loam, forming three-fifths of our lands, and extending in every direction to the confines of the county. Its growth is white and black oaks, poplar, hickory, black and white walnuts, sugar-maple, and other varieties. In the main, the subsoil is a rich, red clay, which under the microscope shows fine particles of sand, and is easily gullied. It is underlaid by sand and gravel at from 10 to 20 feet. The chief crops are corn, cotton, wheat, oats, potatoes, and sorghum, the soil being well adapted to these. Over one-half is planted in cotton, which grows to a height of from 3 to 5 feet, and is most productive at 4 feet. To restrain the plant and favor bolling we plant early, run no center furrow when bedding, bar off while cultivating, and top. On fresh land the seed-cotton product per acre is from 1,000 to 1,500 pounds, 1,780 pounds being required for a 475-pound bale. The staple is from low middling to middling. After fifteen years' cultivation the product is on fair upland, which has been rotated, 800 pounds. The texture is as good, though probably not so long in fiber. The weeds troubling us are careless-weed, purslane, and crab-grass. In the southeastern portion of the county one-eighth of this land lies turned out; in other parts, none. By putting in clover or peas such land in a few years can be made to yield good crops. The soil washes readily on slopes, and the valleys are injured at least 33 per cent. Hillside ditching to a small extent and horizontalizing have been tried with the best results. It is to be regretted that it was not commenced sooner.

The *black loam* forms nearly two-fifths of our land, and generally exists in large bodies. It occurs in every part of the county, and embraces nearly all of the branch, creek, and river bottoms. Its timber is black oak, the finest in the world, red gum, ash, hickory, hackberry, walnut, mulberry, dogwood, papaw, hornbeam, and hazel-nut. Its thickness is from 1 foot to 15 feet. The subsoil is generally a red or yellow clay, which is underlaid by sand at from 20 to 30 feet. The land is easily tilled, unless suffered to bake in dry seasons before being plowed. It is best adapted to corn, cotton, wheat, and oats, and will make from 2 to 4 tons of timothy or clover per acre. All well-drained portions are planted in cotton. It grows from 6 to 10 feet high, but is best at 5 feet. In seasonable years it will yield from 1,200 to 1,500 pounds of seed-cotton, which rates as low middling. After fifteen years' cultivation its product is from 1,000 to 1,300 pounds, the staple not being quite so good. The weeds are cocklebur, careless-weed, and sometimes crab-grass. None of it is turned out. It does not wear out, though it may become exhausted by continuing in one crop. This land is level, and does not wash.

The *whitish-gray or crawfishy* soil forms less than one-fifth of the lands, and can be found in every part of the county at the foot of hills, in depressions on uplands, and in creek and branch bottoms. Cotton is seldom planted on such land.

J. H. SHINAULT (see abstract, Bluff region, Part I) AND DR. T. W. ROANE (southern part of the county).—On the lands of Beaver Dam creek cotton is seldom injured by frost. We prefer upland that is fresh or has been well taken care of.

Upland gray loam forms seven-eighths of our land, and, excepting valley lands, prevails throughout the county. Its thickness is 5 inches or more. The subsoil varies from a pale yellow, crumbling clay to a deep yellow or orange tenacious clay, and is underlaid by sand and gravel (rarely by calcareous layers) at from 20 to 50 feet. The timber growth is hickory, post, white, and red oaks, poplar, and dogwood. When new and fresh the soil is best adapted to corn and oats; when several years old and well preserved, to cotton. Sixty per cent. is put in cotton. Weeds are restrained and bolling favored by very early planting, rapid culture, early laying by, and also by the application of well-rotted manure. The seed-cotton product on fresh land is from 600 to 1,000 pounds, 1,600 pounds being required for a 475-pound bale. After ten years' cultivation the product is from 400 to 1,200 pounds, according to preservation, exposure, and previous tillage. The staple from this is finer, longer, and of a richer color than that from fresh land. Crab-grass is the worst enemy the cotton-plant has. In some localities 5 per cent. of this land lies turned out; in others, from 30 to 50 per cent. If not washed badly, it will, when cultivated again, produce well. For twenty-five years horizontalizing has been done, and where well done the washing is but slight.

The *black alluvial* of the bottoms forms 20 per cent. of our lands, there being, however, not more than 8 per cent. of this land in cultivation. One-half the cleared portion is put in cotton. The seed-cotton product on fresh land is 1,000 pounds per acre, but the yield increases as the land gets older.

The crops of the black upland soil are cotton, corn, wheat, oats, and clover. About three-fifths of this soil is planted in cotton, which grows to a height of 4 feet. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,660 pounds being required to make a bale of 475 pounds. After fifteen years' cultivation the soil will produce 800 pounds if well cared for. The troublesome weeds are crab-grass, smart-weed, rag-weed, and cocklebur. One-tenth of this land lies turned out, but most of it can be reclaimed.

The *gray buckshot soil* is that of branch bottoms, and makes about one-eighth of our soil. It is good for herd's-grass, but not for cotton. The heavy buckshot or bottom land is suited for cotton, and also produces fine herd's-grass.

A. W. SMITH (northwestern part of the county, Indian Creek lands).—The seasons often prove too short for full maturity of the crops. One-half of our cultivated land is put in cotton. The soils are gray uplands and bottom lands above overflow. The latter is a rich loam, mixed with some sand, very productive, and will make under good tillage 1,500 pounds of seed-cotton per acre. It is designated as alluvial, and aggregates a fourth of the land, and occurs near the streams all over the county. Its growth is walnut, hickory, sassafras of large size, beech, gums, cottonwood, black and white oaks, pecan, dogwood, and papaw. There is also a cold gray soil good only for grass; but there is very little of it, and it is not cultivated.

SHELBY.

Population: 78,430.—White, 34,508; colored, 43,922.

Area: 690 square miles.—Woodland, all, excepting small lake areas in the Mississippi bottom.

Tilled lands: 195,726 acres.—Area planted in cotton, 92,620 acres; in corn, 55,260 acres; in oats, 5,216 acres; in wheat, 3,564 acres; in rye, 378 acres; in tobacco, 41 acres.

Cotton production: 46,388 bales; average cotton product per acre, 0.50 bale, 714 pounds seed-cotton, or 238 pounds cotton lint.

Shelby is the most southern of the tier of counties bordering the Mississippi river; a tier which, if Lake and Obion be made one, as they were of old, includes both the whole of the Tennessee portion of the Mississippi bottom and very nearly all of the bluff region belt. Shelby county has comparatively little of the Mississippi alluvium. The line of bluffs strikes the river at Memphis, and is not at any point many miles from it. The comparatively narrow intervening bottoms usually have their higher "front-lands" along the river, supplying cultivated strips at intervals, and lower "back-lands", often swampy, toward the bluffs. Cotton is a chief crop in the cultivated areas.

Disregarding the limited Mississippi alluvium, the county is an undulating upland plateau lying in the bluff region belt. It is abundantly supplied with streams, and the Loosahatchee and Wolf rivers traverse it. Among its creeks Big creek and Nonconnah run through large sections. The chief soil is that of the upland. This, where fresh, is a light-brown loam resting upon an ashen-gray, often yellowish or reddish-yellow, siliceous subsoil, containing more or less of both clayey and calcareous matter. The subsoil in the reports is called clay, a name not expressing its nature. It comes chiefly from the underlying formation of fine siliceous silt or earth called loess, or often, on the slopes, from a mixture of loess with material (sand, gravel, and clay) from strata underlying the loess in turn. (See further under "Bluff region", on page 17, an analysis of the soil and one of the subsoils being there given.) The lands are very fertile and vary little in character. The forest growth is heavy and varied, and consists of white and red oaks, hickories, poplar, sweet and black gums, elm, maple, cottonwood, ash, walnut, beech, honey-locust, mulberry, red-bud, dogwood, occasionally holly, and others. When first cleared the lands produced large crops for half a lifetime, but by bad culture have been in some regions much worn; yet when properly treated they may be restored to almost their original fertility. Cotton is the great staple. The county stands at the head of the list in number of bales produced, and also ranks high in the percentage of bales to the acre. About one-half of the tilled lands of the county is planted in cotton. In some parts the proportion is two-thirds or three-fourths. The bottoms of the Wolf and the Loosahatchee rivers and of the larger creeks supply in the aggregate much rich and available land. As compared, however, with the uplands it has small importance.

Shipments are made to Memphis at 65 or 70 cents per bale.

ABSTRACTS FROM REPORTS.

(Abstracts from the reports, respectively, of H. L. Douglass and W. H. Nelson have been given on pages 18 and 19, under "Bluff region".)

JAMES STEWART (county generally).—The upland varies little, and the level and plateau-like portions are as fine as need be. Rolling lands require to be protected by circling, plowing, and ditching. The low areas are extremely rich. All kinds of soils are put in cotton, which is cultivated all over the county. The original soil is 12 inches or more in thickness, resting upon a yellow, heavy clay loam, averaging 4 feet in depth, very rich and fertile when broken up, sometimes leachy and sometimes impervious. The subsoil is underlaid by sand and gravel. The land is easily tilled at all times, and is well adapted, with fair culture and attention, to any crop suited to the climate. About one-half of the aggregate crop of the county is cotton. The plant grows from 1 foot to 5 feet, the higher the better. The seed-cotton product per acre on fresh land is from 1,000 to 1,700 pounds, 1,720 pounds being required for a 475-pound bale. The staple is first class. On our worst land the product per acre is 350 pounds, requiring five times that much for a bale. The staple is short and inferior. We have no weeds worth noticing. Two-thirds of the land lies turned out; but such land produces as well as ever when it regains freshness, but it is often allowed to go into gullies. The soil washes badly on slopes—to the improvement, however, of the valleys. Efforts are made to check the drainage by horizontalizing and hillside ditching, and is our only chance for working rolling land.

Dr. S. HAMMONTREE AND Dr. W. D. TUCKER (civil district No. 4, lands of Big creek).—The soils cultivated in cotton are the clay loam of the uplands and the alluvial. The clay loam is found on all the uplands, and forms about two-thirds of the lands. It extends west to the Mississippi bottom, east 10 miles, and has a thickness of from 6 to 8 inches. Sand and gravel occur at from 30 to 60 feet below the surface. The soil is easily tilled in dry weather, and is early and warm when well drained. It is apparently best adapted to cotton, in which two-thirds of it is planted. Cotton attains a height of from 2 to 5 feet, 3 and 4 feet being the most productive. To favor bolling some farmers remove the dirt, and some top the plant. The seed-cotton product per acre is from 1,000 to 1,500 pounds, about 1,500 pounds being needed for a 475-pound bale, which rates as middling. After ten years' cultivation level lands (unmanured) will make from 1,000 to 1,200 pounds, about the same as before being required for a bale. The staple on fresh land is longer and coarser; on old land shorter and finer. Very little land lies turned out. In the southeastern portion of the county, however, that turned out amounts to from 10 to 20 per cent. Such land, if again cultivated, produces very well. The soil washes seriously on slopes, very much to the injury of the valleys. Circling has been done to check the damage, with very good results.

THE BROWN-LOAM TABLE-LANDS.

This subdivision includes the following counties: Fayette, Hardeman, Haywood, Madison, Crockett, Gibson, and Weakley, together with large parts of Henry* and Carroll,* and very small parts of the counties mentioned below. The first seven only, called "midland counties", are considered here. Carroll and Henry are referred to in the next group. On the west the southeastern corners of Obion, Tipton, and Shelby, and on the east the northwestern corners of Henderson and McNairy, project into this area, but the parts thus included are inconsiderable.

FAYETTE.

Population: 31,871.—White, 9,633; colored, 22,238.
Area: 640 square miles.—Woodland, all.
Tilled lands: 197,516 acres.—Area planted in cotton, 92,231 acres; in corn, 63,419 acres; in wheat, 3,737 acres; in oats, 3,661 acres; in tobacco, 66 acres.
Cotton production: 39,221 bales; average cotton product per acre, 0.43 bale, 606 pounds seed-cotton, or 202 pounds cotton lint.

Fayette county ranks next to Shelby in the number of bales of cotton produced in 1879, both being much ahead of any other county, and makes the best showing of all upon the map of acreage in cotton. The large tract of upland country in the southeastern corner of the state, bounded on the north and east by the Big Hatchie river, is noted for its great fertility. Of this area, Fayette county is nearly the central as well as an important part. The county is traversed by the Loosahatchee and Wolf rivers, and is well supplied with smaller streams. Much of the surface is level or moderately undulating. The western part is inclined to be hilly, with extended plateaus; the southeastern portion is more hilly, but with fertile valleys. In the southern portion the valley of Wolf river affords much alluvial land in its extended bottoms.

The formation underlying, and in great part giving character to the soils and subsoils of the uplands, is the orange-sand drift, a series of sands, clays, and sometimes gravel. Below the drift are strata more clayey, which, when the former is absent, yield stiffer soils with less sand. The soil of the higher lands is a mellow, warm, siliceous, or sandy loam, well suited to a variety of crops. It is readily washed on the slopes, and requires judicious management. The valleys supply a fair proportion of alluvial lands. The forest growth of the uplands is oak, walnut, poplar, and hickory, often of great size; of the bottoms, white and overcup oaks, beech, red and black gum, birch, and, along the streams, cypress. Shipments are made to Memphis at from $1 50 to $2 25 per bale.

The reports obtained from the county refer chiefly to particular regions, and two are confined to the Wolf river country. No report containing an adequate description of the upland soils in general was received. The characteristics of these, however, are much the same as those of the upland soils of the parts of Hardeman and Haywood counties contiguous.

ABSTRACTS FROM REPORTS.

J. B. THORNTON AND A. L. PEARSON (southwestern corner of the county, creeks of Wolf river).—The uplands in this region are rolling, and are locally known as "ridge land", little of them being sufficiently level to be called table-land. The soils cultivated in cotton are: (1) Creek bottoms; (2) ridge land; (3) "buckshot" clay land. The chief soil is the creek bottom, which forms one-half of the lands, occurring with little variation in all directions. It is generally a yellowish, sometimes dark, sandy loam, about 8 inches thick, and rests upon a sandy yellow clay, which changes to a lighter color upon exposure to the air, and is in most places leachy. Strata of sand are met with at from 20 to 60 feet. The soil is easily tilled at all times, and is early, warm, and well drained. The crops produced are cotton and corn, two-thirds of the land being planted in the former, which grows to a height of from 3 to 3½ feet, but corn is the most productive crop. Cotton runs to weed in wet weather, which can be remedied by throwing dirt from the roots or "barring off". On fresh land the seed-cotton product is 800 pounds per acre, requiring 1,600 pounds for a 475-pound bale, which rates as middling. After three years' cultivation the product is 750 pounds, the same amount being required for a bale, and the staple remaining the same. The troublesome weeds are cocklebur and morning-glory vines. But little of the land lies turned out, and such land produces as well as ever when cultivated again.

The "ridge land" or upland soil makes one-half of our lands, and extends off indefinitely in all directions. The growth is oak, gum, hickory, poplar, etc. It is a sandy clay from 4 to 5 inches thick, resting upon a yellow clay subsoil, with sand below at from 20 to 40 feet. The soil is easily tilled in all seasons, but is sometimes inclined to run together and bake. It is early, warm, naturally well drained, and is best adapted to cotton, in which two-thirds is planted. The cotton grows to a height of 2 feet, and at this is most productive. When fresh, it produces 750 pounds of seed-cotton per acre, 1,600 pounds being required for a bale of 475 pounds. After three years' cultivation it produces from 500 to 750 pounds, the same amount making a bale. The weeds are crab-grass and fox-tail. One-fourth of the land lies turned out, and is owing more to want of hands than to anything else. Such land produces well when again cultivated. It washes seriously on slopes, much to the damage of the lower grounds. Some hillside ditching has been done with good success.

Of the "*buckshot*" *clay loam* there is but little. It is white or gray, with an impervious clay subsoil, contains soft gravel-like particles, and in dry seasons produces cotton well.

A. D. LEWIS (southeastern part of the county, Wolf river lands).—On the west of Wolf river are the fine alluvial lands, but they are low and late, and their crops are liable to be caught by frost. The best cotton land is the black sandy upland—a prairie soil lying mostly on second bottoms and slopes. It forms one-fourth of our lands, and occurs on creeks and along rivers in long strips a fourth to half a mile wide. Its subsoil is sandy and leachy. Two-thirds of the land is planted in cotton, which grows to a height of 3 and 4 feet, the latter being the most productive. On fresh land the seed-cotton product is from 1,000 to 1,200 pounds per acre, and after eight years' cultivation from 600 to 800 pounds. On bottoms, after eight years, the product is from 1,000 to 1,200 pounds. Twenty-five per cent. of this land lies turned out. Such land, when again cultivated, does well for two or three years. On our flat lands we have a white pipe-clay, which is impervious to water.

J. M. GALLAWAY (northwestern part of the county, Cane Creek alluvial region).—The soils are the black alluvial, with here and there crawfishy lands, the latter a white gravelly kind. These make up all our lands. Similar lands are found elsewhere in Fayette, and also

in Tipton and Shelby counties. The growth is poplar, oak, gum, hickory, ash, walnut, elm, and dogwood. The soil is a loam with but little clay. One-half the land is planted in cotton, of which the tallest, though not always the most productive height, is 5 feet. The seed-cotton product on fresh land is 1,600 pounds per acre, requiring 1,545 pounds for a 475-pound bale, which rates as middling and fair. After ten years' cultivation we can see but little difference. Cotton is generally better on lands that have been cultivated for three or four years. About 10 per cent. of the land lies turned out.

HARDEMAN.

Population: 22,921.—White, 13,313; colored, 9,608.
Area: 610 square miles.—Woodland, all.
Tilled lands: 120,437 acres.—Area planted in cotton, 44,885 acres; in corn, 45,207 acres; in wheat, 4,758 acres; in oats, 2,554 acres; in tobacco, 84 acres.
Cotton production: 18,937 bales; average cotton product per acre, 0.42 bale, 600 pounds seed-cotton, or 200 pounds cotton lint.

Hardeman is one of the southern tier of counties, and lies immediately east of Fayette. Its central and western portions are generally level or moderately rolling. The northern part is more broken, but includes many level areas. The eastern and southern portions are more or less hilly, but include many good farming sections. The county is remarkably well and symmetrically watered. The Big Hatchie flows diagonally through it from the southeastern corner to the northwestern, splitting the county into two triangular sections. Into the Hatchie, as the main channel, the numerous tributary creeks, with courses mostly at right angles to the river, pour their contents. Thus the two parts of the county, separated by the valley of the Hatchie, are each cut up into sections by the parallel valleys of the creeks. The streams afford along their borders a large aggregate of rich alluvial land, with which, at intervals, stiff crawfishy areas occur.

The prevailing upland soil, the most important in the county, is a rich, mellow, siliceous loam, warm and early, resting upon a reddish yellow, sandy clay, the underlying formation being the orange sand. It is found all over the county, but spreads out most uniformly in the western and northwestern parts—parts which belong to the area of the highest percentage yield of cotton. In the eastern and southeastern sections of the county, in addition to lands such as have been noticed, are others more clayey and some quite calcareous. These are based upon the outcrops of formations below the orange sand.

The growth of the chief soil, the siliceous loam of the uplands, is in the more level parts of Hardeman red, white, and post oaks, hickory, walnut, wild cherry, dogwood, red-bud, and in the western part black-jack oak. In the more hilly portions, the southwestern, southern, and northeastern, black-jack and Spanish oaks and chestnut are found. The growth of the lowlands is beech, white and red oaks, sweet and black gums, poplar, hackberry, red-bud, cane, and others. Areas of yellow pine occur in the northeastern and eastern portions. Cypress is met with along the streams. Shipments of cotton are made to Memphis at $2 and $2 10 per bale.

ABSTRACTS FROM REPORTS.

H. M. Polk (lowlands and uplands of Spring creek and Hatchie river).—Our uplands vary but little, often affording thousands of acres suitable for cultivation. On account of late and early frosts the uplands are preferred for cotton. The counties in the southwestern part of Tennessee, having generally a soil of rich siliceous loam, are the best for cotton. The soil, which is warm and matures the crop earlier than elsewhere in the state, has been described in Part I. Probably one-fourth of the land once cultivated lies turned out. Time, aided by weeds, broom-grass, *Lespedeza striata*, etc., restores its capacity for half a crop. It washes and leaches very easily, and on slopes seriously, to the injury of the valleys. Horizontalizing and hillside ditching have been practiced by all farmers for the saving of the soil.

The siliceous or the sandy loam of the bottoms of Spring and Pleasant Run creeks form about a twentieth of the lands, and occurs throughout the valleys of the two streams named. Its timber is white and red oaks, beech, red-bud, hackberry, etc. It is of gray, buff, and brown colors, 12 inches thick, resting upon a subsoil of yellowish clay, thought not to be so rich as the red clay subsoil of uplands. It is easily cultivated in dry seasons, is late and well drained, and is best adapted to corn. One-fourth is planted in cotton, which grows to a height of 3 or 4 feet. The plant inclines to run to weed in warm, wet seasons, when the land is fresh. The remedy is shallow cultivation after deep breaking of the soil in the spring. The seed-cotton product on fresh land is from 600 to 700 pounds, requiring from 1,545 to 1,750 pounds for a 475-pound bale. The staple rates high. After twenty years' cultivation the yield is about the same, the staple being shorter. Crab-grass is troublesome. Very little of this land lies turned out. Rest improves all land.

The heavy soil of Hatchie river, mostly above overflow, is a sandy loam similar to that of the uplands, but colder, and makes about a twentieth of our lands. Its timber is white oak, beech, gum, and cane. The soil is a brown or blackish clay loam, 24 inches thick, and rests upon a subsoil of yellowish clay, containing fine white sand. In tilling qualities, crops, proportion, and height of cotton, as well as in seed-cotton product, it is much like the soil described.

O. B. Polk (western part of the county).—The soils cultivated in cotton are: (1) Mellow siliceous upland loam, varying but little; (2) sandy loam bottom lands of Dry creek; (3) gravelly land in small spots of 1 or 2 acres. The chief is the mellow siliceous soil, comprising three-fourths of the lands. It extends north 8 miles to Whiteville, south 15 miles to the state line, west 2 miles to Fayette county, and east 5 miles to Spring creek. Its growth is red, black-jack, post oaks, and hickory. It is a fine sandy dark-colored loam 5 inches thick, resting upon red clay, which, when mixed with the soil, produces well. Sand is met with at from 6 to 10 feet. It is easily tilled in wet or dry seasons, and is early, warm, and well drained. Its chief crops are cotton and corn, but it is best adapted to cotton, three-fourths of the land being planted with this staple. The plant grows to 3 feet, its most productive height. The seed-cotton product per acre on fresh land is 1,250 pounds; on land cultivated for ten years, from 600 to 700 pounds. In the first case, 1,660 pounds are generally required for a 475-pound bale; in the second, 1,780 pounds. Cotton marketed at home is not sold on the basis of staple, but as to cleanliness and freedom from trash. Crab-grass is our enemy. But little of the land lies turned out, say one-fifteenth. Such land, when taken in again, produces well for three or four years. On slopes the soil washes seriously, to the injury of the valleys.

The *sandy loam of Dry creek* forms only one twenty-fifth of our lands. It occurs throughout the area embracing the first soil. Its growth is red oak and hickory. One-third of it is planted in cotton, which attains a height of 4 feet.

The *gravelly land*, of which there is about 1 per cent., occurs in small spots, containing an acre or two each, scattered through the area indicated above for the others. Its growth is persimmon, Spanish oak, and sweet gum. It produces fine cotton when properly drained.

J. A. MANSON AND E. E. LOW (southwestern corner of the county).—The kinds of soils cultivated in cotton are: (1) Mahogany clay (siliceous) loam; (2) black sandy loam; (3) light sandy loam. The chief soil is the mahogany clay soil, which forms four-fifths of the land in this region. Its timber is oak of many kinds, hickory, and chestnut. On the lowlands are poplar, beech, and sweet and black gums. (Description agrees with that given by O. B. Polk.)

The *black sandy loam* constitutes a fifth of our lands. Cotton is planted on two-thirds of this soil, yielding from 1,000 to 1,500 pounds of seed-cotton per acre. The staple rates first class.

The *light sandy loam* forms a twentieth of the lands in this region. Six miles to the northeast and southeast there is much of it. Its growth is black-jack, scrub oak, scrub hickory, and chestnut. It rests upon a subsoil of gray clay, mixed with sand. One-half is planted in cotton, which grows from half a foot to 2 feet in height, yielding from 400 to 600 pounds of seed-cotton per acre. The staple is first class. Two-thirds of the land lies turned out. It washes seriously, to the great injury of the valleys.

WILLIAM RUSH (region northeast from Bolivar, Piney Creek lands).—The upland soils, in patches of from 1 acre to 10 acres, vary greatly from ridge to ridge as to kind and productiveness. The bottoms also vary much. In wet seasons the cotton in bottoms is too late; in dry, it does well; but good upland is considered the best. The soils in cotton are: (1) Black sandy and clay upland; (2) piny bottom land above overflow; (3) crawfishy or white gravelly bottom land. The principal soil is the black sandy and clay upland, about one-fifth of the tillable land, and occurs in patches from the headwaters of Piney creek to the Hatchie river. Its growth is red, black, and Spanish oaks, walnut, and in places yellow pine. It is a fine sandy loam 5 inches thick, and rests upon a yellow clay subsoil, which is mixed with sand, and works well after exposure. Sand is met with at 10 feet. The soil works more easily in wet seasons than that of any other land. Its crops are corn, cotton, wheat, and oats, to all of which it is well adapted. About one-fourth is planted in cotton, the plant growing to 3½ feet. The seed-cotton product per acre is 1,000 pounds, requiring 1,485 pounds for a 475-pound bale; it rates as middling. After ten years' cultivation, if the land is kept from washing, the yield is 800 pounds. Of this 1,545 pounds are required for a bale, the staple differing little. The weeds are cocklebur and crab-grass. One-fourth of the land lies turned out, but little of it being cultivated again. It washes readily on slopes, but has not as yet seriously injured the valleys. Horizontalizing and hillside ditching have been practiced, and with good results where kept up.

The *piny bottom land* forms about one-half of the tillable land, and occurs throughout the length of the valley of Piney creek. Its growth is white oak, gum, beech, poplar, and ash. It is a sandy clay loam, early and warm when well drained, 8 inches thick, with a yellow clay subsoil. It is tilled with difficulty in wet seasons, but very easily in dry. It is best adapted to corn and cotton. About one-fourth is planted in cotton, which grows to 4 feet. Too much rain inclines the plant to run to weed. Our remedy is to turn out the middles with the turning-plow. The seed-cotton product on fresh land is 1,000 pounds per acre; on land worked for twenty-five years it is 800 pounds in good seasons. The staple in both cases rates middling. The weeds are cocklebur, smart-weed, rag-weed, and crab-grass. None of this land lies turned out.

The third soil, the crawfishy, forms about a fourth of the bottom lands. It occurs throughout the valley of Piney creek, and there is hardly a 10-acre field but that has some of it. Its timber is gum, maple, beech, etc. It is a gravelly, whitish to blackish clay loam, sometimes putty-like, 5 inches thick, with a subsoil of a lighter color. The subsoil, when at the surface, is nearly white; is impervious when undisturbed. The soil is late, cold, and ill drained, tolerably well adapted to cotton, in which one-fourth is planted. The plant usually grows to 3½ feet; in wet seasons to 5 feet. The seed-cotton product on fresh land is about 800 pounds per acre; on land worked for fifteen years, 700 pounds. In both cases it rates middling, and 1,545 pounds are required for a bale. The weeds are smart-weed, rag-weed, and cocklebur. None of this land lies turned out.

HAYWOOD.

Population: 26,053.—White, 8,497; colored, 17,556.

Area: 570 square miles.—Woodland, all, excepting a few small lakes in the Hatchie river bottom.

Tilled lands: 137,155 acres.—Area planted in cotton, 49,919 acres; in corn, 39,878 acres; in wheat, 5,326 acres; in oats, 2,976 acres; in tobacco, 62 acres.

Cotton production: 23,092 bales; average cotton product per acre, 0.46 bale, 660 pounds seed-cotton, or 220 pounds cotton lint.

Haywood county ranks third in the number of bales of cotton produced in 1879. Two-thirds of the county lies in the area having the greatest percentage of acreage in cotton. Little variety comparatively is presented in its surface and soil. It is a plateau region, traversed in its southern part by the Hatchie river, and having the South Forked Deer along its northern boundary. These rivers have numerous tributary creeks well distributed through the county. Much of Haywood is a water-shed lying between the Hatchie and South Forked Deer, with gentle slopes, yet embracing large areas of level lands. The chief soil is that of the uplands, a fine, dark, siliceous loam, warm, easily tilled, and extending pretty well over the county. It is mellow, readily washed, and requires careful culture. In some sections the land has been overworked or carelessly worked, and is badly worn or washed. The subsoil is usually a reddish clay, below which lie, at various depths, strata of sand, interstratified occasionally with beds of clay. The growth is white, red, and black oak, poplar, walnut, hickory, ash, dogwood, with papaw and hazel-nut. The creek valleys and the second bottoms of the rivers afford many tracts of valuable land. The second bottoms, lying on the north side of the Hatchie, are noted for their productiveness. The first bottoms of the rivers, as well as of many creeks, making in the aggregate a large area, are subject to annual overflows. Cotton is shipped by rail to Memphis at $2 25 per bale, or by water at $1 50; to Jackson, $1 per bale.

ABSTRACTS FROM REPORTS.

AARON WALKER (county generally).—The soil of the uplands was originally a black, light loam, and all of it was tillable. The first river bottoms are subject to overflow, and are not in cultivation. Cotton on lowlands and on fresh, rich soil is liable to be caught by early frost. We prefer good upland. (For kinds, extent, growth, etc., of soil, as reported, see Part I.) The first, the *black upland loam*, is usually not troublesome either in wet or dry seasons. Cotton is the chief crop, but corn and wheat are raised, with some clover and oats. The soil is adapted to any of these when well managed. From one-half to two-thirds of the land is planted in cotton, which attains a height on the first soil of 4 or 5 feet, and on the second and third soils of 1½ to 3 feet; it is most productive at 4 feet. The plant inclines to run to weed on fresh land in wet seasons. There is no certain remedy; early planting should be practiced. The seed-cotton product on fresh land is from 1,200 to 1,500 pounds, 1,545 pounds being required for a 475-pound bale. Staple rates with the best. After five years' cultivation

the product is from 1,000 to 1,200 pounds, but much depends upon the season and cultivation. The staple compares favorably with that of fresh land. Crab-grass and careless-weed are the most troublesome. One-tenth of the land lies turned out. Such land, after a crop of pease, and when well circled, will produce well when again cultivated. It washes readily on slopes, the valleys being rather benefited thereby. Horizontalizing and hillside ditching have been practiced with good results where well done and when in time.

F. A. LORD, J. W. KERR, AND DR. H. C. ANDERSON (central, western, and northwestern parts of the county).—The lands of this region in their virgin state were covered with the wild pea-vine and but few bushes. The soils cultivated in cotton are: (1) Upland soil, a light sandy loam, with a clay foundation, very tender and easily washed, not showing sand in excess, as in Madison county; (2) bottom soil, a heavy mixture of loam and sand when good; when not so good, pipe-clay and gravelly loam; (3) the poorest, a stiff white clay, but productive when well drained. The first, the *upland soil* or *loam*, is the chief soil, and forms about two-thirds of the upland, or, including the bottoms of the Hatchie and Forked Deer, one-half the lands. The growth on the best cotton land is black oak, hickory, a few poplars, and some white oak; near the rivers, on second bottoms, poplars and large red oaks predominate. The soil is dark colored, and contains small and soft blackish pebbles, which crush easily. At 40 feet a stiff clay is met with, then sand or white and yellow gravel and hard and smooth sandstone. The chief crops are cotton, corn, wheat, sorghum, Irish and sweet potatoes, oats, etc. The soil suits all of them. About four-sevenths of the land is planted in cotton. The seed-cotton product is from 1,000 to 1,600 pounds per acre, of which from 1,485 to 1,840 pounds, depending partly upon the year, are required for a 475-pound bale. After twenty-five years' cultivation the product is from 250 to 350 pounds, but with a little manure it may be doubled. Crab-grass is our worst enemy. Three-tenths of the land lies turned out so far as I can judge. Such land taken in again is the very best for cotton when well managed, but does not hold out more than two years. It washes badly, the great trouble in West Tennessee. The valleys are not always injured thereby. We check the damage mostly by circling, with sufficient fall. It requires thought and tact to do it well, but the results are the very best.

The *glady soil*, of which there is but little, has a growth of white and post oak. Cotton is generally planted upon it, but the yield is uncertain. The land is flat, and does not wash.

HENRY WILLIAMS (northwestern part of the county).—The soils cultivated in cotton are: (1) Black soil with little sand, loose and soft; rolling upland; (2) black, with small black gravel; no sand; (3) level, white gravelly land, cold, wet, and late. The first is the chief soil. One-half of the land is of this kind. It is suited to corn and cotton, two-thirds being planted in the latter. The soil is from 4 to 12 inches thick, and rests upon a hard, rather sticky red clay subsoil. The seed-cotton product is from 800 to 1,200 pounds, requiring from 1,425 to 1,780 pounds for a 475-pound bale. The second soil is somewhat rolling, and forms about one-third of the lands. It is much like the first soil. About one-half is planted in cotton. The third soil forms about one-sixth of the lands, its chief growth being the post oak, and nearly all of it is planted in cotton, which grows to a height of from 3½ to 4 feet. The seed-cotton product per acre is from 500 to 1,000 pounds. The land remains the same for years. There are no slopes, and hence there is no washing.

H. M. CLARKE AND J. B. BRANTLY (eastern part of the county, between the Hatchie and Forked Deer rivers).—The soils cultivated in cotton are: (1) Fine sandy loam, easily cultivated, and if well circled will not gully badly; (2) a deep, dark, slightly sandy loam of creek bottoms; on this, unless old, cotton grows too rank and matures too slowly; (3) soil mixed with pipe-clay, also of the bottoms; very tenacious, and when wet, very wet; when dry, hard, tough and lumpy in breaking up; drained and broken up, will make the very best cotton in a dry year. The first is the chief kind, forming three-fourths of our ridge land. It extends 5 miles to the west, and from the Forked Deer river, through Madison and Hardeman, to Bolivar county. It is 3 inches thick, and is underlaid by reddish, more tenacious clay, and contains some gravel. Gravel and rock are found at from 5 to 10 feet. Nearly one-half of the land is put in cotton, which grows to 3 feet, the most productive height. Cotton runs to weed when not brought to a stand early and is too wet and badly cultivated. Our remedy is early thinning, good cultivation, and shallow plowing. The seed-cotton product is 1,400 pounds per acre, 1,660 pounds making a bale of 400 pounds. On land worked for twenty-five years the product is 500 pounds, 1,300 pounds making a bale. The staple on the old land is slightly better. The only weed seriously troubling us is crab-grass. About one-fourth of the land lies turned out. It produces finely when taken in again, if properly cared for and green manure is turned under before seeding.

The *bottom or swamp lands* are in small proportion. The bottom of the Forked Deer river averages a mile in width. Some of this land lies on creeks. The soil is blackish, a part whitish or gray, from 6 inches to several feet in thickness. The subsoil is generally sandy clay; in places clay and gravel. But very little of this land is cultivated. When protected from overflow the land produces corn, cotton, and grasses well.

J. M. SHAW AND PROFESSOR JOSEPH NELSON (eastern part of the county).—Our soils are: (1) The chocolate-colored, undulating hazel-nut plains, the most important and best; (2) white clay loam, adjoining uncultivated bottoms. The soil of the plains or gently rolling uplands form three-fourths of our tillable area, including all the more valuable lands. It extends widely over West Tennessee. The subsoil under the hazel lands is clayey and easily gullied, and contains frequently water-worn pebbles. About three-fourths of the land is planted in cotton. The best height of the plant is 4 feet, which it usually attains. The slopes wash seriously. Horizontalizing is practiced with marked success. In certain more rolling sections one-tenth lies turned out.

The *white clay loam* occurs along all our streams, and, excepting in Hardeman county, where there is more sand, along all the streams in this end of the state. Post oak is the unfailing characteristic growth. The soil is a clay intermixed with buckshot gravel. Cultivation has disclosed no difference between soil and subsoil, save its hard-pan and impervious character. Not much of it is planted in cotton. The plant grows to 3 feet in height. The seed-cotton product is about 1,500 pounds per acre, which is greater after a few years' cultivation, but never equals that of the uplands. Washes from the slopes improve this land.

There is much of the impoverished hazel plains. In Haywood the clay washes easily, and is wasting. The timber was taken off long ago. The negro hands go over it and raise a little low cotton. It never goes to weed; we would that it might.

MADISON.

Population: 30,874.—White, 15,406; colored, 15,468.

Area: 580 square miles.—Woodland, all.

Tilled lands: 125,693 acres.—Area planted in cotton, 45,825 acres; in corn, 46,885 acres; in wheat, 9,623 acres; in oats, 3,157 acres; in tobacco, 67 acres.

Cotton production: 19,257 bales; average cotton product per acre, 0.42 bale, 600 pounds seed-cotton, or 200 pounds cotton lint.

Madison is one of the four counties forming the central area of West Tennessee, the others being Haywood, Crockett, and Gibson. It is nearly square in shape, and, like Hardeman, is cut diagonally by a river into two triangular sections. These sections are nearly equal. The river is the South Fork of the Forked Deer river, running northwestward from the southeastern to the northwestern corner of the county. The Middle Fork of the Forked Deer

river runs through and drains the extreme northern portion of the county, while the creeks of the Big Hatchie drain the southwestern. For the greater part the drainage of the surface is into the valley of the South Fork. From the disposition of the waters of the three rivers, the area of the county is made to consist generally of two wide dividing belts of uplands, with the South Fork between and the two slopes of the other streams to the north and the southwest respectively. There are many creeks, some of which are of large size, such as Little Middle Fork, Johnson's, and Cypress. In the main, the surface is a level or undulating table-land. The eastern and southern portions, however, have very rolling or hilly sections. Low ridges, with thinner soils, are sometimes met with on the table-lands.

The deepest strata are beds of usually dark stratified sands and clays. These are mostly covered and concealed by the more superficial deposits of the orange sand. Some of the underlying clays outcrop in the eastern and southeastern parts of the county, giving origin to strips of stiff argillaceous soils. The soil of the uplands is very generally a mellow siliceous or sandy loam, brown when fresh, early, warm, and well suited to cotton culture. It is based on a reddish or sometimes yellowish sandy clay subsoil. The gentle slopes, bottoms of the smaller streams and second bottoms of the larger, afford much good land. The bottoms of the rivers are low, flat, in great part subject to overflow, and are unfit for cultivation. The growth of the uplands includes white, Spanish, black, red, and post oaks, hickories, ash, poplar, mulberry, dogwood, walnut, beech, and in different sections a smaller growth of papaw and hazel-nut. On the poorer ridges are black-jack, post oak, hickory, and some chestnut. The valleys of the branches and the second bottoms of the larger streams supply "poplar", sweet gum, red and white oaks, hickories, maple, walnut, mulberry, ash, sassafras, dogwood, and papaw; and the river bottoms beech, sweet gum, overcup and other oaks, ironwood, hornbeam, shell-bark hickory, maple, poplar, cypress, holly, and tupelo-gum. Cotton is the great crop. Most of the county lies within the greatest percentage belt of acres in cotton, there being 15 per cent. or more of the total area planted in cotton. The remainder of the county (strips to the northwest and southeast) has from 10 to 15 per cent. in cotton. Cotton is shipped by rail to Memphis or Mobile at about $3 per bale.

ABSTRACTS FROM REPORTS.

G. C. BUTLER AND S. M. OSIER (southeastern part of the county, lands of the Forked Deer and its branches).—The uplands vary from slightly rolling to hilly. The soil is in patches of a few acres to 40 and 50 acres. Uplands are preferred, on account of early frosts. The soils planted in cotton are: (1) Dark upland, on ridges, slopes, and level fields; (2) dark sandy soil of the valleys of the Forked Deer river and the branches above overflow; (3) black, muddy, and sandy soils of these streams. The *dark upland* is the chief soil. Three-fourths of the cotton is raised on such land, a fine sandy loam from 3 to 5 inches thick, and early in dry springs when well drained. The chief crops are corn and cotton first; then wheat, oats, rye, and pease; but the soil is best adapted to corn and pease, though other crops do well. Cotton comprises about three-fifths of the crops, and grows to 2 or 5 feet, but is most productive at 3 or 4 feet. The plant inclines to run to weed on rich, fresh lands when the late summer is wet. Manure favors bolling. The seed-cotton product per acre on fresh land is from 800 to 1,200 pounds, 1,660 pounds being required for a 475-pound bale. The staple is middling and low middling. After twenty years' cultivation the product is from 300 to 1,000 pounds, and the staple about the same. Smart-weed and others abound on good land, but grass is the worst. One-fourth of the land lies turned out, and when taken in again does tolerably well if level and not washed in gullies. The soil washes seriously on slopes, often to the injury of the valleys. Horizontalizing has been practiced with good success where well done.

The *dark sandy soil of the valleys* varies in places and on different sides of the streams. It is from 6 to 8 inches thick. Two-thirds is planted in cotton, which grows to a height of 4 or 6 feet, but is best at 4 or 5 feet. The seed-cotton product per acre on fresh land is from 800 to 1,200 pounds, 1,660 pounds making a 475-pound bale. Staple is middling. After twenty years' cultivation the product and staple are about the same. The weeds are smart-weed, cocklebur, and other kinds. Very little lies turned out, and where taken in again it has done well. The washing of the soil, the damage done, and the remedy applied are the same as with the first soil.

The *black sandy soil of the bottoms* forms about one-fourth of our lands, and varies on different sides of the streams like soil 2. It is in the main a fine sandy loam, dark grayish in places, sometimes gravelly, with here and there a clay loam. Cotton grows to 5 or 6 feet. Seed-cotton product per acre on fresh land is from 1,000 to 1,200 pounds when favorable. The staple is middling and low middling. The product on land after twenty years' cultivation is nearly as much as on fresh land.

JOHN Y. KEITH, JOHN J. BOON, AND THOMAS INGRAM (lands of creeks and Forked Deer river).—Early frost is our most serious trouble. A variety of cotton maturing a month earlier than what we have would increase the crop at least one-third. The soils cultivated in cotton are: (1) The table or upland, most reliable, but differing in short distances; (2) creek and branch bottoms; (3) river bottoms. The chief soil is the upland, forming perhaps nine-tenths of our land, and extending, with considerable variation, through most of the county. It is a dark loam, with a little sand, is from 4 to 10 inches thick, and rests upon a sandy, generally yellow, sometimes reddish, clay subsoil. The subsoil is occasionally gravelly or mixed with coarse sand. If hard-pan, it is marked by pools of waters. Tillage is more difficult in wet than in dry seasons.

The soil is best adapted to corn, but produces cotton, wheat, oats, rye, pease, potatoes, peanuts, clover, etc. About one-half the crop is cotton, which grows to 3 and 4 feet, but is best at 3½ feet. We restrain the plant by topping it about the 12th of August. The seed-cotton product per acre on fresh land is from 800 to 1,000 pounds, from 1,485 to 1,660 pounds making a bale of 475 pounds. It rates as other cotton. On land worked for thirty years the product is from 500 to 700 pounds, a bale requiring the same as before, with no difference in staple. The weeds are crab- and foxtail-grasses, rag-weed, cocklebur, smart-weed, iron-weed, white bloom, golden rod, and others. Ten per cent., perhaps, lies turned out; but where taken in again, unless injured by washing or the tramping of stock, it has produced well. It washes seriously on slopes, many fields being nearly ruined and the valleys injured. Horizontalizing and hillside ditching have been practiced, but not with uniform success, as great rains break over and flood the lower lands, doing great damage.

A. D. HURT (western part of the county, lands of Johnson's and Cub creeks and Forked Deer river).—The area reported covers a space 3 miles wide and 6 miles long, on which more cotton is raised than in any other section of the county. For cotton growing we need a dry June; then some rain from the 1st to the 15th of July; then mostly dry weather for a month for blooming and fruiting. The chief soil, *black sandy upland and second bottom*, commonly designated "table-land", and covering three-fourths of the county, is early, warm, and well drained. Its crops are cotton, corn, wheat, etc. Cotton forms about three-fifths of the crops, and attains a height of 4 or 5 feet; warm rains and keeping the crop clear of grass incline the plant to run to weed. We restrain this by throwing dirt from the roots with a small shovel-plow, care being taken not to check too suddenly. The seed-cotton product per acre on fresh land is, in good seasons, from 1,000 to 1,500 pounds, from 1,485 to 1,780 pounds being required for a bale of 475 pounds. Staple rates good middling. After ten year's cultivation, if crops have been properly alternated, the land will produce as good cotton, if not better, than when fresh. Crab-grass is the troublesome weed. I know of none of this land turned out. The washing on slopes is not serious, and the valleys have been injured about 3 per cent. Horizontalizing and hillside ditching have been practiced with favorable results.

The *black-jack ridges*, occurring to the east and southeast, form about a fifth of the lands. The soil is from 1½ to 2 inches thick, and rests upon a red clay containing more or less sand. Below this again is sand at from 15 to 40 feet. The soil is best adapted to cotton, in which about two-fifths is planted. The cotton attains a height of 3 feet, and rarely runs to weed. The seed-cotton product per acre on fresh land is from 350 to 700 pounds, of which from 1,600 to 1,800 pounds are required for a 475-pound bale. After ten years' cultivation the product amounts to little or nothing. One-third lies turned out, and such land is seldom taken in again. It washes seriously, to the injury of lower lands. Horizontalizing and hillside ditching have been tried with unsatisfactory results, the land not justifying the labor.

The *buckshot and crawfishy soil* forms about one-fifth of the lands. It is about 3 inches thick, rests upon a whitish clay subsoil with little sand, which becomes hard upon exposure to the sun; is impervious, contains some gravel, and is underlaid by sand at from 25 to 40 feet. The land is best adapted to grasses. One-tenth is planted in cotton, yielding from 350 to 500 pounds of seed-cotton per acre. Cultivation for a number of years increases the yield.

E. C. HARBERT AND T. C. LONG (western part of the county, lands of Cypress and Johnson's creeks and Forked Deer river).—This region is one of the best for varied crops. With fertilizers and proper cultivation we can make a bale of cotton of 500 pounds to the acre, the only drawback being the shortness of the season. The soils are: (1) The brown, fine, loamy soil of the second bottoms and table-lands, the most reliable; (2) soil of hill or ridge land, as productive as the first, of the same color, but more worn; (3) bottom and swamp land and greenbrier glades, of little value except for timber. The chief soil is the first mentioned, which comprises one-third of the lands and extends through Madison and other counties, and rests upon a subsoil which changes to a deep yellow or red clay at a depth of from 4 to 5 feet. Its crops are corn and cotton, but it is best adapted to corn. More than one-half is planted in cotton, which attains a height of from 2 to 5 feet; but 3 or 4 feet is the best. The seed-cotton product per acre on fresh land is from 1,200 to 1,500 pounds, 1,780 pounds making a bale of 475 pounds. On land worked for ten years the product is from 800 to 1,000 pounds. It rates middling in both cases. Over one-third of the land is turned out. Such land taken in again produces well after the first year. It washes seriously on slopes, sometimes to the ruin of the valleys. Not much horizontalizing has been done since the war. When properly done the results are good. The second soil forms more than a third of the land, and like the first spreads over several counties. It is from 6 to 10 inches thick, and rests upon a subsoil which is yellow at first and then changes to red. Some of the subsoil is impervious; sand lies below at from 10 to 15 feet. The soil is best adapted to corn, cotton, and sweet potatoes.

Cotton forms over one-half of the crops, and grows from 1 foot to 4 feet high, 2½ to 3 feet being the best. The seed-cotton product is from 800 to 1,200 pounds, 1,660 to 1,780 pounds making a bale. The staple rates as middling. After fifteen years' cultivation the product is from 700 to 800 pounds, the same as before being required for a bale, and the staple rating the same. As to washing and the remedy, see under first soil. The third soil or land forms one-third of all, and occurs along all the rivers from head to mouth. Cotton is very rarely planted upon it.

M. V. B. EXUM (northwestern part of the county, lands of Cane and Dyer creeks and Middle Fork of Forked Deer river).—About one-fourth of these lands consist of *black buckshot*, rather wet, with a hard-pan subsoil. The second bottoms are richer than the uplands, and, where sandy enough, are preferred; but where sand does not predominate, the uplands or hill lands are preferred. The chief soil is the sandy loam of the second bottoms and some adjacent uplands, which occurs in different directions for 6 miles, and has a red clay subsoil, with more or less sand. The tillage is easy in dry seasons; less so in wet. After heavy rains the soil becomes hard. It is best adapted to cotton, corn, and clover. More than one-half is planted in cotton, which attains a height of from 4 to 5 feet, 3 feet being the best. Wet and warm weather in July and August incline the plant to run to weed, for which topping and taking the dirt from the roots are the remedies. The seed-cotton product per acre on fresh land is from 1,000 to 1,500 pounds, 1,615 pounds making a bale of 475 pounds. The staple is middling to fair. On land worked for ten years the product is from 800 to 1,000 pounds, a little less being needed for a bale. The staple then rates as middling to good middling. The weeds are crab-grass, foxtail, rag-weed, purslane, smart-weed, etc. Very little of the land lies turned out, say one-twentieth, and such land, when taken in again, if not too much in gullies, produces fairly well. The slopes wash seriously, to the injury of the valleys, and some few farms have been ruined. Horizontalizing and hillside ditching have been practiced—the only salvation for hilly lands.

J. D. PEARSON (northeastern part of county).—The soils are: (1) Black clay loam, mixed with sand, second bottom, and upland; (2) alluvial, above overflow or drained; (3) light sandy upland, subject to drought. The first is the chief soil, and forms a fourth of our lands. It extends north from 6 to 20 miles, west 40, south 40, and east 2 miles, and is 10 inches thick. The subsoil is yellow or red, baking hard on exposure, but under cultivation gradually becoming like the soil, though requiring manure to make it fertile. It is underlaid by sand at from 12 to 15 feet. The land is generally easily tilled, and produces corn, cotton, wheat, and some oats. It is best adapted to corn and cotton, one-third being planted in the latter. The plant grows to 2 or 4 feet, 3½ feet being the best. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,485 pounds being required for a bale of 475 pounds. The staple is as good as any. After eight years the product is about 600 pounds, 1,545 pounds then being required for a bale. About one-tenth of the land lies turned out, and where taken in again it does well if not too badly washed. The soil washes seriously in many places, in some localities to the injury of the valleys. Some hillside ditching has been done with success.

The second soil, the *alluvial*, forms one-fourth of the lands. It is best adapted to corn and wheat. Not much is planted in cotton. In dry seasons, on fresh land, it produces 1,200 pounds of seed-cotton to the acre.

The third soil, the *light sandy*, forms half the lands, with the same extent as the first soil. It is 4 inches thick, and rests upon a sandy subsoil, and is best adapted to sweet potatoes, peanuts, and melons. It is difficult to estimate the proportion of cotton planted, as it lies in patches; but when fresh it yields 600 pounds of seed-cotton product to the acre, and after six years' cultivation 400 pounds.

M. P. COLLINS (northeast from Jackson).—The soils vary little. Cotton is always slow in growing, on account of cold nights in late spring and early summer. Much is killed, and the stand is often ruined. Then again the fall frosts often damage the cotton in the boll. The soils are all sandy, and extend for miles on every side. The subsoil is a sandy clay. Sand and gravel lie below at from 5 to 10 feet. The soil is easy to till in dry weather, but difficult in wet. It is late and cold, but well drained. The crops are cotton, corn, wheat, oats, potatoes, and clover. This soil is perhaps best adapted to corn; but nearly one-half of it is planted in cotton, which grows from 3 to 6 feet high, 4 feet being the best. The plant may run to weed on fresh ground in wet weather. To restrain it we use Peruvian guano or stable manure. The seed-cotton product on fresh land is 1,000 pounds per acre, 1,660 pounds making a 475-pound bale. The staple rates as good middling. On land worked ten years the product is 800 pounds per acre, 1,600 pounds then making a bale, the staple being somewhat shorter. Hog-weed and smart-weed are the most common pests. About 1 per cent. of the land lies turned out, and where taken in again, if manured and clovered, produces excellently. The soil washes seriously on slopes, sometimes covering the valleys with sand. Horizontalizing and hillside ditching have been practiced, and with very great success where well done.

D. R. ALLISON (southeast from Jackson, lowland).—The soil cultivated in cotton in this section is *gray gravelly land*, which lies near water-courses and contains gray gravel. This soil, when rained upon after being plowed, looks white. Its timber is beech and elm. One-half of it is planted in cotton, which attains a height of 3 feet. The seed-cotton product on fresh land is from 800 to 1,000 pounds per acre. Of this 1,485 pounds are needed for a 475-pound bale. On land worked for four years the product is the same. The weeds are crab-grass, cocklebur, and smart-weed. The wash from slopes has ruined some of the valley lands. Horizontalizing and hillside ditching have been practiced with good results in some cases.

CROCKETT.

Population: 14,109.—White, 10,493; colored, 3,616.
Area: 260 square miles.—Woodland, all.
Tilled lands: 65,428 acres.—Area planted in cotton, 17,807 acres; in corn, 25,650 acres; in wheat, 9,883 acres; in oats, 1,501 acres; in tobacco, 35 acres.
Cotton production: 9,320 bales; average cotton product per acre, 0.52 bale, 747 pounds seed-cotton, or 249 pounds cotton lint.

Crockett county, claimed by some to be the best body of land for its dimensions in the state, lies lengthwise and symmetrically, in a northwest and southeast direction between two of the forks of the Forked Deer river—the Middle Fork on the northeast and the South Fork on the southwest. Excepting two small segments on the northeastern and southwestern sides, respectively, the one belonging to Gibson and the other to Haywood, the county occupies all the space from fork to fork. Its surface, therefore, is a water-shed, extending longitudinally through the county, with general drainage from a central and higher belt. To the northwest, however, the higher belt is split nearly equally in two by the valley of Pond creek, which rises near the county-seat, Alamo, and runs northwestward out of the county. The surface is further cut by Cypress, Black, and other smaller creeks. In general the county is an upland plateau region, modified by the streams as above indicated. It has many level areas. Sections more or less hilly occur in the western, northwestern, and eastern portions. There is comparatively little of low bottom land; but the second bottoms afford much land, which of late years has been cultivated in cotton with fair success.

The soils out of the low bottoms are very generally fine siliceous or sandy loams based on yellowish or reddish sandy clays, the underlying formation being chiefly the orange sand, and they all produce cotton. The area planted in cotton is from 10 to 15 per cent. of the total area of the county. In considering the soils, Crockett may be divided lengthwise into three nearly equal belts, two lateral or outside, bordering the rivers respectively on the northeast and southwest, and a middle one between. The two lateral belts, supplying the best and strongest lands, are heavily timbered with large white and red oaks, yellow poplar, hickory, ash, elm, maple, beech, gum, walnut, dogwood, papaw, etc. The middle belt has a thinner, lighter soil, is higher and more rolling, and is covered with a dense growth of small black oaks, white "poplar", hickory, etc. In dry, favorable seasons the lateral belts produce the most cotton; in wet seasons, the middle belt. Taking the years together, they all yield about the same average. The staple of cotton raised on the middle belt is finer than that of the others. Cotton is shipped to Memphis by rail at $2 50 per bale.

ABSTRACTS FROM REPORTS.

P. M. NEAL (western part of the county, waters of Black creek and South Forked Deer river).—The soils cultivated in cotton are: (1) Dark clay loam of the uplands; (2) a light and fine gray soil, intermixed with brownish gravel and a little fine whitish sand, lowland; in the main above overflow; (3) light brownish soil. The first is the chief soil, and forms one-fifth of this civil district, or, taking the whole county, one-twelfth of the lands. It occurs in spots mostly on the highland belts adjacent to the river valleys, and is from 10 to 12 inches thick. The subsoil is a light and tough yellow clay, baking hard when exposed, and quite impervious to water. It contains more or less hard, yellowish gravel, and is underlaid by sand at from 5 to 6 feet. The land is tilled with difficulty in wet or very dry seasons, but with ease if the ground is in good condition. It is warm when well drained, producing chiefly corn, cotton, and wheat, but is best adapted to the first two. About one-fifth is planted in cotton, which grows from 3½ to 5 feet high. The plant inclines to run to weed in wet weather, and the only remedy known to me is to drain and cultivate lightly. The seed-cotton product on fresh land is 800 pounds per acre, 1,780 pounds making a bale of 475 pounds. After fifteen or twenty years' cultivation the product is about 600 pounds if the land is not washed and not too far exhausted. Of this 1,545 pounds make a bale. The staple of old land is considered better than that of the fresh, and the best cotton is made on such land. Cocklebur, crab-grass, and foxtail are the pests. Not more than one-thirtieth of this land lies turned out. Such land taken in again produces well if the soil is not washed away, especially if broken up the previous fall. Soil washes readily on slopes, causing damage in places. Some valleys are injured, but not seriously. Horizontalizing and hillside ditching have been practiced, but to no great extent. Where done well, the results are very good.

T. J. WOOD (county generally).—Our soils are: (1) Black poplar, second bottom, and upland; (2) clay soil, worn out or poor lands, and plenty of it; (3) buckshot, or white crawfishy, low for cultivation and poor. The first is the chief soil, forming one-third or more of the lands. It is from 3 to 5 inches thick, is difficult to till in wet weather, but easy in dry. The crops are corn, cotton, wheat, and oats, the soil being best adapted to corn. About one-fourth is planted in cotton, which grows from 3 to 3½ feet high, 3 feet being the best. The plant tends to run to weed on fresh ground and in very wet weather, and the remedy is topping. The seed-cotton product on fresh land is 800 pounds, 1,660 pounds making a bale. The staple rates as middling. After five years' cultivation the product is from 400 to 500 pounds, and the staple is shorter and a shade under middling. Crab-grass is troublesome. Very little of this land lies turned out, and when taken in again does well if seeded to clover or sown in pease. The soil washes seriously on slopes if not attended to, but the valleys are rather benefited. Horizontalizing and hillside ditching have been practiced with very good results.

E. J. READ, SR. (lowland of Black creek and uplands generally).—The soils cultivated in cotton are: (1) Black poplar, creek, valley, and upland; (2) second river bottom; (3) thin red clay. The first is the chief soil, forming one-half of the lands, and extending off from 10 to 20 miles. This soil is 8 inches thick. The subsoil is tough reddish clay, baking hard, but gradually becoming soil by cultivation, which contains some gravel, and is underlaid by sand at from 10 to 20 feet. The land is easily tilled in dry weather, but is difficult in wet, and about equally adapted to the crops produced. About half the crops is cotton, which averages 2½ feet in height, 3 feet being most productive. If necessary, topping in August restrains the plant. The seed-cotton product on fresh land is 1,200 pounds, 1,900 pounds making a bale of 475 pounds. Staple rates as middling. On land worked for six years the product is 800 pounds, 1,780 pounds then making a bale, and the staple is better. Crab-grass is the pest. About one-tenth of this land lies turned out, and when taken in again produces well for several years. The soil washes readily on slopes, but the damage is not serious, the valleys being greatly improved thereby.

The *second river bottom* forms about one-third of the lands. It is a clay loam, 8 inches thick, with a subsoil like that of the first soil. About two-thirds of this land is planted in cotton. The seed-cotton product on fresh land is from 1,200 to 1,500 pounds per acre. About one-twentieth lies turned out. In other respects it is like first soil.

The *thin red clay* forms one-fifteenth of the lands, and is 2 or 3 inches thick. The subsoil is a red clay, but is not fertile. The land is early, warm, well drained, and best adapted to cotton, which forms two-thirds of the crops. The seed-cotton product is 800 pounds per acre, the staple rating middling. On land worked four years the yield is 400 pounds per acre, the staple being better

GIBSON.

Population: 32,685.—White, 23,540; colored, 9,145.
Area: 550 square miles.—Woodland, all.
Tilled lands: 146,163 acres.—Area planted in cotton, 36,820 acres; in corn, 57,838 acres; in wheat, 26,016 acres; in oats, 3,378 acres; in tobacco, 56 acres.
Cotton production: 19,272 bales; average cotton product per acre, 0.52 bale, 747 pounds seed-cotton, or 249 pounds cotton lint.

Gibson county lies chiefly between the South Fork of the Obion river on the northeast and the Middle Fork of the Forked Deer on the southwest. To this must be added a small segment cut off by a bend in the latter river, and lying on the Crockett county side. The longest line that could be drawn in Gibson would lie in a northwesterly and southeasterly direction about midway between the rivers mentioned, and would connect the northwestern and southeastern corners of the county. Rutherford Fork of the Obion river traverses the northeastern part of the county. Little North Fork of the Forked Deer is an important stream. Besides these, there are many creeks draining all parts of the surface. Gibson county is a part of the great plateau region of West Tennessee, and is the most northerly of four counties constituting a central group in West Tennessee, the others being Crockett, Haywood, and Madison. The surface of the county is generally level, though cut up or made more or less rolling by the valleys of the streams. South and east from Trenton, the county-seat, the county is more hilly than in other sections. The prevailing soil is uplands, a sandy, fertile, and mellow clay loam with sandy clay subsoil, the latter generally resting upon strata of the orange sand. The parts of the bottoms of the rivers and larger streams above overflow afford a comparatively small proportion of the lands. Some of these are dark and rich, others (and no inconsiderable part of the whole) are light colored and crawfishy. The growth of the uplands is "poplar", white, red, and black-jack oaks, sweet and black gum, ash, elm, hickory, walnut, beech, chestnut, dogwood, papaw, hazel, etc.; that of the bottoms or second bottoms, oak, hickory, beech, sweet gum, ash, and some papaw. The lands are well suited to the growth of cotton, and this is the principal crop. But for the shortness of the season the yield, acre for acre, would be equal to that of some of the best lands much farther south. With the exception of the northeastern corner of the county, the relative proportion of the area planted in cotton is from 10 to 15 per cent. of the total area. In the part excepted it is from 5 to 10 per cent. Cotton is shipped by rail to Memphis at from $2 to $2 25, and to New Orleans at $3 25 per bale.

ABSTRACTS FROM REPORTS.

L. P. McMURRY AND J. W. HAYS (southwestern part of county, Big Creek and Forked Deer River lands).—Creeks flowing into the Forked Deer have low, wet bottoms, subject to overflow, and mostly unfit for cultivation. Uplands vary greatly from clay loam to "buckshot". Rains often prevent early planting, and early frosts often injure the plant before maturing, especially on fresh land and lowlands. The soils cultivated in cotton are: (1) Clay loam on level and rolling uplands; (2) dark and gray loam soil of the Forked Deer river and its tributaries above overflow; (3) "buckshot" upland, containing small ore-like gravel—a cold land. The *clay loam* is the chief soil, forming about 85 per cent. of our lands, and occurring throughout the county. It is yellow clay loam from 8 to 12 inches thick. The subsoil is a tough yellow clay, with more or less sand, baking when exposed, and by culture becoming like the soil; leachy on the slopes, impervious when undisturbed, and underlaid by sand at from 15 to 25 feet. Tillage of the land rather difficult when wet, but generally not troublesome. Early when well drained. The crops are corn, wheat, oats, cotton, red clover, timothy, and herd's-grass. The soil is well suited to all. One-third of the tillable land is planted in cotton. Deep plowing and much vegetable mold cause the plant to run to weed; shallow plowing, with stable manure and superphosphates, restrain it. The seed-cotton product on fresh land is 1,000 pounds per acre, 1,720 pounds making a 475-pound bale. Staple rates as middling. On land worked ten years the product in ordinary seasons is from 800 to 900 pounds, 1,600 pounds making a bale, but the staple is not so long as on fresh land. The weeds are crab-grass, foxtail, smart-weed, and cocklebur. About 2 per cent. of the land lies turned out. A little has been reclaimed, but does not produce well. Soil washes seriously on hilly land, and sometimes ruins the lower lands. Horizontalizing and hillside ditching have been practiced with good results.

The *dark and gray loam* of the lowlands, forming about 5 per cent. of the lands in this region, occurs along the river and larger creeks throughout the county. The subsoil is a tough bluish clay, baking hard, but by cultivation becoming like the soil. It is impervious when undisturbed, and is underlaid by sand at various depths. Tillage is not difficult unless when wet. The soil is generally late, and is best adapted to corn and sorghum; but much of it is planted in cotton, the latter growing to 4 and 7 feet, a medium most productive. Wet weather inclines the plant to go to weed. The seed-cotton product is about 1,200 pounds per acre, 1,720 pounds making a bale of 475 pounds. Staple is middling. After ten years' cultivation the product ranges from 800 to 1,000 pounds, with the staple about the same. The weeds are smart-weed, cocklebur, crab-grass, and foxtail. Little of the land has been turned out. Some injury is caused by washes from upland.

J. M. SENTER AND Z. BRYANT, SR. (county generally).—The soils of the county are: (1) Dark-brown clay loam; (2) Dark sandy loam in small proportion. The first is the prevailing soil of the county. The subsoil is a yellow clay, underlaid by sand at 15 feet. The crops are cotton, corn, clover, wheat, oats, and grasses. The soil is best adapted to the first three, but one-half of it is planted in cotton, which attains a height of from 3 to 6 feet. Topping is practiced to restrain the plant from going to weed on fresh land. The seed-cotton product on fresh land is 1,000 pounds per acre, 1,780 pounds making a bale of 475 pounds. After four years' cultivation the product is from 1,000 to 1,200 pounds. The staple is middling in both cases. None of the land lies turned out. The slopes wash seriously, and the valleys are also injured thereby. Hillside ditching has been practiced with good results.

The second soil is met with over the county. The subsoil is a reddish-yellow clay. Cotton grows from 2 to 3 feet, 2½ feet being the best. The seed-cotton product on fresh land is from 600 to 800 pounds, 1,780 pounds making a 475-pound bale. On land worked for four years the product is 700 pounds. The staple is middling in both cases. Little of the land lies turned out, and when taken in again produces well after pease or clover. The washing of slopes, etc., as under the first soil.

WEAKLEY.

Population: 24,538.—White, 20,125; colored, 4,413.
Area: 620 square miles.—Woodland, all.
Tilled lands: 129,075 acres.—Area planted in cotton, 15,406 acres; in corn, 50,001 acres; in wheat, 25,479 acres; in tobacco, 4,770 acres; in oats, 1,795 acres.
Cotton production: 7,576 bales; average cotton product per acre, 0.49 bale, 702 pounds seed-cotton, or 234 pounds cotton lint.

Weakley is one of the northern tier of counties adjoining the state of Kentucky, and is well supplied with water-courses, which flow very generally in a westerly direction. Two of the large forks of the Obion river, the North Fork in the northern part of the county and the Middle Fork in the southern, pass entirely through its area. On the southwest the South Fork of the Obion separates the county from Crockett. The creeks tributary to these are very numerous, and some of them are large. The county is a typical part of the plateau slope of West Tennessee. Its surface is generally level, but more or less broken areas occur, as around Dresden, the county-seat. The northeastern part inclines to be hilly. The formation underlying the subsoil is chiefly the orange-sand drift; but occasionally, in banks along streams outcropping from beneath this, the dark laminated sands and clays of a lower formation are seen. The prevailing soil, that of uplands and sloping lands, is generally a brown, siliceous loam, more or less clayey, fertile, and suited to corn, wheat, cotton, tobacco, oats, potatoes, grasses, and indeed any crop of the latitude. The growth is black and other oaks, poplar, beech, hickory, black and sweet gum, black walnut, dogwood, and hazel-nut. In parts of the county, as east of Dresden, are areas denominated "barrens", which are of different kinds, the "hickory, dogwood, and black gum barrens" affording good land, the "post-oak barrens", with land of second quality, and the "black-jack barrens", with poor land. The streams of the county are, for the most part, sluggish, and their bottoms low, more or less subject to overflow, and comparatively of little agricultural value. The parts above overflow, however, supply good land. On the map showing percentage areas of cotton it is seen that in about two-thirds of the county, including the southern and southwestern portions, the relative per cent. of acreage in cotton to total acreage for the census year was from 5 to 10; in most of the remainder from 1 to 5 per cent. In the extreme northeastern part it was 0.1 to 1. Cotton is shipped by rail to Nashville at from $1 to $1 25, and to New Orleans at $3 25 per bale.

ABSTRACTS FROM REPORTS.

J. C. LIPSCOMB, G. PATTERSON, AND E. D. TANSILL (southwestern part of the county, Mud creek and Obion River lands).—The uplands vary. Some are white-oak highlands, with hickory and poplar, and the most productive; some have a red oak growth; but others are post-oak glady lands. The uplands are preferred for cotton on account of shortness of season; but with a late fall, as in 1879, bottom lands make the best crops. The soils put in cotton are: (1) The white-oak and hickory highlands and the post-oak ridge; (2) branch bottom and second bottom of the smaller rivers. The first is the chief soil, and forms about one-third of the area, or half the lands in cultivation. The soil is a clay loam (the white oak part brown, the glady part whitish) from 3 to 8 inches thick. The subsoil is a yellow clay, washing easily, but rather impervious. Land is easily cultivated in dry seasons, but not in wet, and is early when well drained. All our crops do well on it. One-third of the crops in this section is cotton, which averages about 3 feet in height. The seed-cotton product on fresh land is about 1,000 pounds, from 1,660 to 1,780 pounds making a bale of 475 pounds; on land five years in cultivation the product is from 800 to 1,000 pounds. The staple is much the same in both cases. Crab-grass, with some foxtail, is troublesome. About 8 or 10 per cent. of the land lies turned out. Such land when taken in again does poorly unless manured. Hillsides are rarely reclaimed. The slopes wash seriously, but the valleys are not much injured thereby. Little if any effort is made to check the damage.

A. M. SMYTH (southern part of county, Spring Creek and Obion River lands).—As a general thing none but the first quality of lands are cultivated in cotton. The soils are: (1) Brown sandy of table-land and second bottoms; (2) gray or mulatto, undulating; (3) poor and broken. The first is the chief soil, and forms about one-third of our lands. Thickness, 6 inches. Subsoil is light, loamy, and gray. Tillage is easy in dry seasons, but less so in wet. Land is best adapted to cereals and grasses. One-fourth is planted in cotton, which grows to 3 and 4 feet in height. Plants are restrained by barring off with turning-plow and by topping. The cotton-seed product on fresh land is from 1,000 to 1,200 pounds per acre, from 1,425 to 1,500 pounds making a 475-pound bale; on land worked for ten years the product is from 600 to 1,000 pounds, the staple on fresh land being the best. Crab-grass is the troublesome weed. But little land in my section is turned out, and that generally is damaged by the tramping of stock. Slopes wash seriously, but the valleys are not much injured thereby. Ditching has been done with success.

T. D. MARTIN, G. W. ISBELL, AND S. C. CRAVENS (northwest from Dresden).—The soils cultivated in cotton are: (1) Upland; (2) bottom. The chief soil is the upland, forming four-fifths of the lands. It is a clay loam, mahogany and black alternating, and 5 inches thick. The subsoil is a tough, yellow clay, impervious when undisturbed. The land is best adapted to corn. Ten per cent. of cotton is planted. Plant is restrained by topping. The seed-cotton product on fresh land is 1,200 pounds per acre, 1,660 pounds making a 475-pound bale; on land in cultivation for ten years from 800 to 900 pounds, from 1,545 to 1,600 pounds making a bale. Staple on fresh land is a little longer. Crab-grass is the most troublesome.

The *bottom land* is about one-fifth of the lands. It is a black loam 12 inches thick. The subsoil is a tough whitish clay, baking hard on exposure, but becoming like the surface soil. Tillage is not usually troublesome. The soil is early when well drained. Cotton grows from 4 to 6 feet high. Topping is resorted to when necessary. The seed-cotton product is from 1,200 to 1,500 pounds, according to season, about 1,660 pounds making a 475-pound bale.

HENRY.

(See "Summit region of the water-shed".)

CARROLL.

(See "Summit region of the water-shed".)

OBION.

(See "The Bluff region".)

TIPTON.

(See "The Bluff region".)

SHELBY.

(See "The Bluff region".)

HENDERSON.

(See "Summit region of the water-shed".)

McNAIRY.

(See "Summit region of the water-shed".)

THE SUMMIT REGION OF THE WATER-SHED.

In this region are included the middle part of Henry county, the eastern part of Carroll, nearly all of Henderson and McNairy, and the western margins of Hardin,* Decatur,* and Benton.* The southeastern corners, respectively, of Hardeman* and Madison* project into the area of this subdivision. The two latter counties have been described under "Brown-loam table-lands". Further, the northwestern corner of Henderson is cut off to the table-lands, and the northeastern part of Henry to the western valley of the Tennessee river.

HENRY.

Population: 22,142.—White, 15,488; colored, 6,654.
Area: 550 square miles.—Woodland, all.
Tilled lands: 133,392 acres.—Area planted in cotton, 13,186 acres; in corn, 51,852 acres; in wheat, 20,853 acres; in oats, 3,171 acres; in tobacco, 2,726 acres.
Cotton production: 5,516 bales; average cotton product per acre, 0.42 bale, 597 pounds seed-cotton, or 199 pounds cotton lint.

Henry is the most northeasterly county of West Tennessee. Its northeastern corner reaches to the Tennessee river, and its northern boundary coincides with the Kentucky line. It is near the northern border of the cotton-growing region. The northeastern half of the county had on an average in the census year less than 1 per cent. of its area planted in cotton, the southwestern and the southeastern corners from 5 to 10 per cent., and the remainder of the county from 1 to 5 per cent. The summit-line dividing the waters of the Mississippi from those of the Tennessee runs in a direction a little north of east through the center of the county. Along this line or "divide" are strips of ridgy land with sandy soil, easily washed, but producing fair crops of corn, wheat, and cotton. To the west of the line the county slopes at first gently away, then becomes level, supplying large sections of fine farming lands, the whole well watered by a great spray of branches and creeks, the headwaters of the middle and north forks of the Obion river. To the east of the summit-line the general slope to the Big Sandy and Tennessee rivers is greater, and the country more broken; nevertheless, extensive areas of level and nearly level productive lands occur. The eastern slope is broken chiefly by West Sandy river and its tributaries.

The prevailing soil of this county is a brown siliceous or sandy loam, found on uplands and slopes and in the valleys of the smaller streams, upon which corn, wheat, cotton, oats, and tobacco grow well and are the leading crops. The subsoils are yellowish or reddish clays, more or less sandy. The timber is white and black oaks, poplar, hickory, and dogwood; also, interspersed with these, are elm, walnut, ash, mulberry, red-bud, etc. On the higher lands, with a thinner soil, are red, post, and sometimes black-jack oaks, chestnut, etc. There is no great extent of tillable bottom land along the larger streams. Second bottoms are often desirable tracts. The growth of the bottoms consists of beech, white and water oaks, sweet gum, poplar, maple, and cypress; that of the second bottoms is much the same, excepting cypress.

The underlying formations are various. In the middle and western portions are great strata of laminated sands and clays, and in the extreme eastern and northeastern portions are beds of limestone and cherty rocks. All these, however, are generally concealed by the beds of the orange sand, the latter giving origin to the sandy soils.

Cotton is shipped by rail to Memphis or Saint Louis at from $2 to $3 per bale.

ABSTRACTS FROM REPORTS.

S. C. DOBBINS (southern and southwestern part of the county).—Rolling and level table-land. The black sandy soil, which forms one-fourth of the lands, is preferred for cotton, and extends 12 miles south of Paris, where most of the cotton of the county is raised. Thickness, 6 inches. The subsoil is generally clay, underlaid by sand at from 10 to 15 feet. Tillage is easy in all seasons. One-tenth of the crops consists of cotton. To restrain the plant and favor bolling some farmers top, but I doubt the advantage. The seed-cotton product on fresh land is 1,000 pounds per acre, 1,545 pounds making a 475-pound bale; on land worked a number of years the product is from 600 to 800 pounds, the staple middling in both cases. The weeds are rag-weed and cocklebur. I cannot say how much land is turned out, but when taken in again, if sown in pease, it would be improved. Slopes wash seriously, and valleys are much injured.

J. F. CAVITT (western part of the county, waters of the forks of the Obion river).—The black sandy loam of hazel-nut valleys and ridges in the northwestern part of the county is the chief soil, making one-tenth of the lands, in bodies of from 50 to 1,000 acres or more, and from 5 to 8 inches thick. The subsoil is brownish-red, leachy, and is considered injurious when mixed with the soil. Tillage is easy in dry seasons, but is not very troublesome in wet. Land is early and warm when well drained, and is best adapted to corn, tobacco, wheat, and cotton, in the order named. About one-tenth of crops is cotton, which reaches 3½ feet. The plant is restrained, when necessary, by topping from the 1st to the 10th of August. The seed-cotton product on fresh land is from 700 to 1,200 pounds per acre, 1,660 pounds making a 475-pound bale; after ten years' cultivation, if the land is cared for, from 600 to 800 pounds, from 1,660 to 1,780 pounds making a bale. Staple of fresh land is middling upland; that of old land hardly so long. Only grasses are troublesome. Much of the land is turned out, and is not improved thereby. The slopes sometimes wash seriously; some valleys are thus injured, others not. Some horizontalizing and hillside ditching are done, with very good results.

The blackish clay or black table-land of the southwest, forming one-fifteenth of the lands, is found in large tracts, and is from 5 to 8 inches thick. Subsoil is brownish-red sandy clay. Tillage is rather difficult in wet seasons, and the land is early. Cotton forms one-fifteenth of the crops, which grows to a height of 3½ feet. Seed-cotton product on fresh lands is from 800 to 1,000 pounds per acre, 1,660 pounds making a 475-pound bale. Staple is middling upland. On land ten years old, if preserved, the product is from 700 to 1,000 pounds per acre. Grasses only are troublesome. Washing of soil, the damage and remedy, are as under first soil.

The clay or ridge land of the southwest, forming one-tenth of the lands, occurs in large tracts, with red and post oak growth; thickness, from 2 to 3 inches. Subsoil, pale yellow clay, underlaid by sand at some depth. Land is late and cold when well drained, and is best for corn and grasses. One-fifth of the crops is cotton, which grows to 2½ feet. The seed-cotton product on fresh land is from 400 to 700 pounds, requiring from 1,660 to 1,780 pounds for a 475-pound bale. Staple rates middling upland. On land worked for ten years, if preserved, the product is 300 pounds, and it then requires from 1,780 to 1,900 pounds for a bale. The staple is shorter. Not much washing occurs on slopes, but the valleys are injured thereby. Horizontalizing and hillside ditching have been practiced with moderate success.

A. ROBINS (south of east from Paris, land of Gin branch and Big Sandy river).—The soils are much the same, and are: (1) Black sandy, level; (2) gray sandy, rolling; (3) pipe-clay of creek bottoms. The *black sandy* is the chief soil, forming a third of the lands, and extends 2 miles northeast and 6 miles southwest. It is a sandy loam from 8 to 10 inches deep. The subsoil is a yellow sandy clay, productive when exposed for a time, and underlaid by sand at from 10 to 20 feet. The chief crops are corn, cotton, and tobacco, one-third being cotton, which grows from 3 to 3½ feet. Seed-cotton product on fresh land is from 1,000 to 1,200 pounds per acre, 1,485 pounds making a bale. The staple rates well. After thirty years' cultivation the product is from 500 to 800 pounds per acre, the staple and amount required for a bale being as before. The weeds are cocklebur and careless-weed. None of the land lies turned out. Slopes wash seriously if neglected, and horizontalizing and hillside ditching have been tried with considerable success.

D. L. WILLETT (southeastern part of the county, in the angle between the Big and West Sandy rivers).—The crops of the *upland sandy loam* are cotton, corn, tobacco, wheat, oats, pease, peanuts, potatoes, and sorghum; but the lands are best suited to cotton and peanuts. Post-oak glades make fair cotton. Cotton forms three-fourths of the entire crop, and grows from 3 to 4 feet high. Topping about the middle of August restrains the plant from growing rank on fresh ground or in wet seasons. The seed-cotton product on fresh land is from 1,000 to 1,500 pounds, from 1,660 to 1,900 pounds making a bale of 475 pounds. Staple rates good ordinary. The product on old land falls off with loss of soil, and staple loses length and fineness. Weeds are crab-grass, cocklebur, foxtail, and purslane.

The *black sandy bottom* forms about a sixth of the lands. Very little of it is planted in cotton. The plant grows from 2 to 5 feet in height; a medium is most productive. Seed-cotton product on fresh land is from 500 to 1,200 pounds per acre, but after five years' cultivation the crop is better. One-fifteenth lies turned out.

The *rolling second bottom* forms about a tenth of the lands. One-fifth is planted in cotton, which grows from 2 to 4 feet high, but is best at 3 feet. One-tenth lies turned out. Slopes wash badly, valleys being injured thereby. Horizontalizing and hillside ditching have been tried with only moderate success.

J. R. WILLIAMS, B. D. BOWDEN, W. P. SMALLWOOD, AND DR. W. S. FRYER (county generally).—The soils cultivated in cotton are: (1) Black sandy loam on flat and productive highlands, also in bottoms of the Obion and Sandy rivers; (2) gray sandy, moderately light soil, ridgy or hilly; (3) light poor soil, upland and hilly; (4) whitish clay of flatlands. The *black sandy loam* forms about a fourth of our lands, embracing much of the southern portion of the county, and is from 6 to 15 inches thick. Subsoil is red clay. This land is best adapted to corn, wheat, rye, and sorghum. About one-fourth of the crops is cotton. The plant grows from 2 to 4 feet, the latter the best, which can be restrained, if necessary, by topping in August. Seed-cotton product on fresh land per acre is from 800 to 1,500 pounds, about 1,900 pounds making a 475-pound bale. On land worked five years the product is from 400 to 800 pounds. The weeds are crab-grass, cocklebur, and hog-weed. About one-third of this land lies turned out, and if taken in again would do fairly if not gullied. Slopes wash seriously, but valleys are not much injured thereby. Some horizontalizing and hillside ditching have been done, though not generally with good results.

The *gray sandy* forms a fourth or more of our lands, extending pretty well over the county, with a thickness of from 4 to 6 inches. The subsoil is a reddish clay. Land is early and warm, and is best adapted to cotton. The largest proportion of crops is cotton. Plant grows from 1½ to 3 feet, the latter the best. Seed-cotton product on fresh land is from 500 to 1,000 pounds per acre, 1,900 pounds being required for a 475-pound bale. Staple is second class. On land cultivated five years the product is from 400 to 700 pounds, and the same is required for a bale. Staple is a shade better. The weeds are as on first soil. One-half of this land lies turned out, but where taken in again it does fairly if not washed. Washing on slopes, etc., as under first soil.

The *light poor soil* occurs in small proportion over the county, and has a growth of oaks of different kinds, post, black, red, and black-jack; thickness from 2 to 4 inches, and is best adapted to grass. Very little is planted in cotton. Plants grow from 1 foot to 2 feet, the latter being the best. Seed-cotton product on fresh land is from 200 to 400 pounds per acre, 2,010 pounds making a bale of 475 pounds. Staple is only common. Crab-grass is troublesome.

The *whitish clay of flatlands* forms about a tenth of cultivated lands. Growth, post and white oaks, shell-bark hickory, etc. The subsoil is whitish clay, becoming soil on exposure, quite impervious, and underlaid by sand at from 8 to 15 feet. Land is late; generally too wet, and is best adapted to grass and corn. About one-fourth is planted in cotton, which grows to 3 feet. The seed-cotton product on fresh land is from 800 to 1,000 pounds per acre, 1,800 pounds being required for a 475-pound bale. Staple, middling upland. On land worked ten years and cared for the product is from 600 to 800 pounds. Crab-grass only is troublesome. Very little land is turned out, and is level and does not wash.

A *sandy loam of hazel hollows and branch bottoms*, much less in extent than the others, occurs in tracts of from 100 to 500 acres. Growth, black oak, hickory, and black-jack. The soil is fine sandy loam, 8 inches thick. The subsoil is sandy, leachy, and underlaid by sand at from 3 to 10 feet. Tobacco grows finely upon it. One-fourth of the crops is cotton, which grows to 3½ feet, the best height. Seed-cotton product per acre on fresh land is from 1,200 to 1,500 pounds, 2,140 pounds making a bale of 475 pounds. Staple rates middling upland. After ten years' cultivation the product is reduced to 800 or 1,000 pounds per acre. Crab-grass is troublesome. Washing of land is as under first soil.

CARROLL.

Population: 22,103.—White, 16,524; colored, 5,579.

Area: 550 square miles.—Woodland, all.

Tilled lands: 120,231 acres.—Area planted in cotton, 24,711 acres; in corn, 46,076 acres; in wheat, 17,354 acres; in oats, 3,413 acres; in tobacco, 100 acres.

Cotton production: 10,505 bales; average cotton product per acre, 0.43 bale, 606 pounds seed-cotton, or 202 pounds cotton lint.

The greater part of Carroll (more than two-thirds) is drained by the head streams of two forks of the Obion river, South Fork and Rutherford's Fork. The remainder of the county, the eastern end, is drained by the Big Sandy river, which traverses the county, passing out at the northeastern corner. To the west of the Big Sandy, and crowding upon its valley, is the belt of highlands dividing the waters of the Mississippi from those of the Tennessee. Regarding the county from this "divide", we have to the west a plateau slope embracing the middle and western parts, and to the east a valley (though no very deep one) constitutes the remaining part. The middle part is much broken. There are two small areas, corners of the county, not included above: the extreme southwestern, crossed and drained by the Middle Fork of the Forked Deer river, and the extreme southeastern, lying on the divide between the Big Sandy and the Tennessee.

The northern and western portions of the county present many level areas; but the middle, southern, and eastern portions are often broken, and the latter are sometimes hilly. The prevailing soils of the county are brown and grayish loams, more or less sandy, found on uplands and in the valleys of branches and small streams, with reddish and

yellow and reddish clayey subsoil, the whole underlaid usually by sand, but in some localities within a belt running north and south through the middle of the county by laminated clay (soap-stone). The growth includes hickory, poplar, post, red, and black oaks, and gum, and, locally, ash, walnut, cherry, and chestnut. The principal crops are corn, cotton, wheat, oats, pease, sorghum, tobacco, sweet and Irish potatoes, clover, and grasses. The lands appear to be best adapted to corn and cotton. On the map of relative acreage in cotton it is seen that the county had, with the exception of two portions, from 5 to 10 per cent. of its area in cotton. The exceptions are: the southwestern corner, in which the percentage was greater, from 10 to 15, and a peninsula-like portion running down from Henry, nearly through the middle of the county, in which it was less, from 1 to 5 per cent. Cotton is shipped by rail at $2 75 to Memphis and $3 25 to New Orleans and Mobile.

ABSTRACTS FROM REPORTS.

A. R. CARNES AND T. N. LANKFORD (northern and northwestern part of the county, Obion uplands).—Bottoms do not produce cotton in this region. The soil cultivated in cotton is the light sandy loam of the uplands, forming about 40 per cent. of our lands, and extending off 20 miles in every direction. About one-fourth is planted in cotton, which grows to a height of 3½ feet, the best for a good yield. Warm, wet, and cloudy Augusts incline plants to run to weed, for which no remedy is known here. Seed-cotton product per acre on fresh land is from 600 to 1,000 pounds, 1,545 pounds making a bale. After fifteen years' cultivation the product is 600 pounds, but varies greatly, according to the care taken. The staple is best on old land, seed lighter, and lint longer. The weeds are careless-weed, cocklebur, crab-grass, and foxtail. One-tenth of the land is turned out; if taken in again would produce well if not gullied. Slopes wash seriously; some valleys are injured thereby. Hillside ditching has been done with success.

E. T. BOHANNON AND B. T. HILSMAN (western part of the county, lands of Lick and Reedy creeks and Obion river).—Cotton is cultivated on good upland and on black sandy bottom land. The chief soil is good upland, forming one-half of our lands, and extends many miles north, west, and south. The country to the east is broken and varied to the Tennessee river. The soil is blackish, and is from 6 to 12 inches thick. Subsoil, a red and yellow clay, underlaid by sand at from 15 to 20 feet. Tillage is easy in dry, but difficult in wet seasons. The chief crops are corn, wheat, and cotton. One-fourth of the crops is cotton, which grows from 2½ to 5 feet high, but is best at 4 feet. Seed-cotton yield per acre on fresh land is from 1,000 to 1,500 pounds, 1,545 pounds making a bale of 475 pounds, the staple rating as good middling. On land worked 10 years the product is from 700 to 1,000 pounds; amount for bale and staple as before. Weeds are crab-grass and cockleburs. Five per cent. of the land lies turned out, and if not washed would produce well again for a few years. Slopes wash readily, and valleys are more or less injured.

J. F. SLOAN (western part of the county, Obion lands).—The black sandy soil of the "hickory barrens" is our best cotton soil, and will make fair cotton every year, wet or dry. Yellow sandy soil fires in dry seasons, causing squares to shed. Dry branch bottoms and old bottoms manured will bring good cotton, maturing early and opening well. On rich bottoms cotton grows too tall and shades itself, causing the bolls to rot and not to open. On gravel or clay land it is difficult to get a stand. The chief crop is cotton, the soil being best adapted to this and corn. One-half or more of the crops is cotton. The plant grows to 4 feet, which can be restrained, if need be, by close cultivation or throwing dirt from the plant to destroy fibrous roots. Seed-cotton product per acre on fresh lands is from 1,000 to 1,200 pounds, 1,425 pounds being required for a 475-pound bale. The weeds are crab-grass, cocklebur, and smart-weed. Very little of the land lies turned out. On such land, when taken in again, crops are generally light. Slopes wash seriously if neglected; valleys are also injured. In some places hillside ditching has been done with very good results.

J. H. JORDAN (northeastern part of the county, lands of Hollow-rock creek and the Big Sandy river).—The chief soil is the sandy clay loam of the flat uplands. Its crops are corn, wheat, oats, and cotton, but the land is best adapted to corn. One-third of the crops is cotton. The plant grows to 4 feet, 3½ feet being the best. Topping is used to restrain plant, if need be. Seed-cotton product per acre on fresh land is 1,000 pounds, 1,545 pounds making a 475-pound bale, the staple rating as good middling. The weed is cocklebur. No land lies turned out. Sandy slopes wash readily, but the damage is not great. Horizontalizing and hillside ditching have been done with good results.

Of the *black hilly uplands* there are 1,000 acres in this region. The soil is 8 inches thick, and is best adapted to corn. One-third of the crops is cotton. Seed-cotton product on fresh land is 1,000 pounds per acre, 1,545 pounds making a bale; staple rates as good middling. None of the land lies turned out.

The *black bottom soil* forms a third or less of our lands, and is best adapted to corn. One-third of the crops is cotton. Plant grows to 4 feet, most productive at 3 feet; restrained, when need be, in wet weather by topping. Seed-cotton product is 1,000 pounds per acre, 1,545 pounds making a bale; staple rates as good middling. Cocklebur is the troublesome weed. No land lies turned out.

WILLIAM JOHNSON (southeastern part of the county, Roane's Creek and Big Sandy River lands).—The lands cultivated in cotton are: (1) Coarse black sandy, lying up; (2) fine red sandy; (3) pale yellow clay land. The *coarse black sandy* forms one-tenth of our lands, and occurs in tracts of 10 and 20 acres, alternating with the red sandy for miles. It is a sandy loam 8 inches thick. The subsoil is yellowish, getting white on going down, and underlaid by sand at about 6 feet. Tillage is easy in dry seasons, but difficult in wet. The land is early, warm, and well drained, and is best adapted to cotton, corn, and grass. One-third of the crops is cotton, which usually grows to 2½ feet, but is best at 3½ feet. Warm, wet weather inclines the plant to run to weed, which is restrained only by dry weather and ceasing to plow. The seed-cotton product on fresh land is from 800 to 1,000 pounds per acre, 1,720 pounds being required for a 475-pound bale. On land worked ten years the product is from 500 to 800 pounds, and 1,660 pounds are then required for a bale; staple is better than on fresh land. The weeds are cocklebur and careless-weed. One-fifth of the land lies turned out; if taken in again and not washed it would produce well. Slopes frequently wash seriously, and the valleys are more or less injured. Horizontalizing and hillside ditching have been done with good results.

The *red sandy soil* forms also a tenth of the lands; thickness, 5 inches. Subsoil yellow for 6 feet down, then whiter, and underlaid by white sand. One-third of the crops is cotton, the latter usually growing 3 feet high. Seed-cotton product on fresh land is from 700 to 900 pounds, and 1,720 pounds are needed for a bale. On land worked eight years the product is from 400 to 700 pounds, 1,660 pounds making a bale; staple better than on fresh land. Weeds as under first soil. One-tenth of this land is turned out; if taken in again and not gullied would produce very well for a short time. Washing on slopes damages as under first soil.

The *pale yellow clay soil* forms about one-third of the cotton lands, and occurs in bodies of from 20 to 40 acres for long distances. Growth, red and post oaks and some dogwood. Thickness, 3 inches. Subsoil deeper yellow than the soil, and underlaid by gravel at 2 or 3 feet. Tillage is difficult in wet weather; less so in dry. The soil is late, cold, and ill-drained, and is best adapted to corn and grass. One-third of the crops is cotton, the latter growing usually to 18 inches; best at 3 feet. Seed-cotton product on fresh land is from 600 to 800 pounds, 1,690 pounds being needed for a bale; after ten years' cultivation the product is from 400 to 500 pounds. One-sixth of this land is turned out; if not washed, and taken in again, it would produce well for a time.

HENDERSON.

Population: 17,430.—White, 14,414; colored, 3,016.
Area: 580 square miles.—Woodland, all.
Tilled lands: 93,241 acres.—Area planted in cotton, 22,344 acres; in corn, 37,734 acres; in wheat, 9,791 acres; in oats, 4,543 acres; in rye, 238 acres; in tobacco, 123 acres.
Cotton production: 9,419 bales; average cotton product per acre, 0.42 bale, 000 pounds seed-cotton, or 200 pounds cotton lint.

Henderson is pre-eminently the summit county of the water-shed. From its high table-lands and ridges the Middle and South Forks of Forked Deer, Big Sandy, Beech, and White Oak rivers all take their rise, flowing off severally to all points of the compass. The forks of Forked Deer gather waters for the Mississippi; the other rivers are tributary to the Tennessee. Beech river has its head streams in the central portion of the county, flows eastward, receives tributary creeks from most of the eastern portion, and finally entering and crossing Decatur county empties into the Tennessee river. With many level areas, much of Henderson is rough and hilly. This is especially true of parts of the highlands which divide the western and eastern waters. Going both westward and eastward from this, the surface is less hilly, becoming finally, to the west especially, simply undulating.

The soils are the brown sandy loams of the uplands, rolling lands, branch and second bottoms, and the darker loam of creek bottoms. In the western parts of the county the sandy uplands and rolling lands are generally preferred for cotton; in the eastern and southeastern the second bottoms and bottoms are considered best. The deep formations are strata of laminated clays and sands, and to the east and southeast a greenish marly, more or less clayey, material, loaded with fossil shells, called greensand, or rotten limestone. The latter outcrops at intervals in the eastern and southeastern parts of the county, giving a rich dark soil and a stiff subsoil, often called "joint clay". (See page 21, under "Black Prairie Belt".) The deep formations, however, are often concealed by the beds of sand (and sometimes gravel) of the orange sand, which supply, in the main, the characteristic soils of sandy loam. In the growth of the higher lands red, post, and black oaks, and hickory are common, with black-jack oak and chestnut on the thinner lands. The chief crops are corn, cotton, wheat, oats, and potatoes. The growth on second and first bottoms includes white oak, sweet gum, beech, poplar, and hickory, with walnut, sugar-tree, etc. On the map showing for 1879 percentage of acres in cotton in given areas, it is seen that, with the exception of a strip in the northeastern corner, the percentage of the northwestern half of the county was from 10 to 15, and of the southeastern half from 1 to 5. In the part excepted it was intermediate, from 5 to 10. Cotton is shipped by water to Cincinnati at $1 25, or to Mobile and New Orleans and Cincinnati at $3 25 per bale.

ABSTRACTS FROM REPORTS.

E. W. CUNNINGHAM (county generally).—The soils vary greatly, the southern sides of slopes being often sandy, while the northern sides are more clayey. Cotton on lowlands with deep soil inclines to run to weed, and sometimes is caught by early frost. Second bottoms are most reliable. Fresh black sandy uplands are well adapted to cotton, but burn in midsummer, causing the dropping of squares. The second bottom soil is cultivated easily in dry seasons, and is early, warm, and generally well drained. One-third of the crops is cotton; plants grow from 3 to 5 feet, the medium height best. The seed-cotton product per acre on fresh land is 800 pounds, 1,545 pounds making a bale of 475 pounds; staple rates middling. On land worked for three years the product is 500 pounds, 1,545 pounds making a bale; staple a shade inferior. The weeds are hog-weed, careless-weed, purslane, and crab-grass. Little of the land lies turned out, and is easily kept up. Such land taken in again produces too much weed the first year. Slopes wash seriously; valleys are much injured. Little horizontalizing and hillside ditching as yet, but so far as done the results are good.

The soil of hilly and rolling uplands is from 1 inch to 6 inches deep. Subsoil is coarse sandy. Land easily cultivated, and early and warm. One-third of the crops is cotton. The seed-cotton product per acre on fresh land is from 700 to 800 pounds, from 1,425 to 1,545 pounds making a 475-pound bale; staple is middling. After three years' cultivation the product is from 400 to 500 pounds per acre. One-fifth of the land lies turned out, and would produce well again if manured. Horizontalizing and hillside ditching are done with good results.

The brown clay loam of lowlands has a lighter clay subsoil. Tillage is easy in dry seasons, but difficult in wet. One-tenth of the crops is cotton, which grows from 4 to 6 feet high. Warm, wet weather inclines the plant to run to weed, which is restrained by throwing dirt off with a turning-plow. The seed-cotton product per acre on fresh land in dry seasons is from 600 to 1,000 pounds, 1,600 pounds making a bale. Staple rates well, being heavy. The land remains productive for years, and when overflow is escaped it makes the best cotton. The weeds are Spanish needle, butter-weed, etc. One-tenth of the land lies turned out, but it would produce well again if broken up deeply in the fall or winter.

W. C. TRICE (southwestern part of the county, uplands of Forked Deer headwaters).—The chief soil, the sandy loam, makes three-fourths of our lands. It is a mahogany, sometimes reddish clay loam, 4 inches thick, with a leachy subsoil. It is easily tilled in dry seasons, and is early, warm, and well drained. One-half of the crops is cotton, plants growing to 3 feet. Late planting and wet seasons cause the plant to run to weed, which is restrained by early planting and on hard beds. Seed-cotton product per acre on fresh land is 1,000 pounds, 1,600 pounds making a 475-pound bale. The staple rates as good middling. After five years' cultivation the product is 900 pounds, and after ten years' cultivation 700 pounds, in the latter case 1,660 pounds making a bale. Staple is one grade lower, or middling. Crab-grass and foxtail are troublesome. One-tenth of the land for from 6 to 10 miles in each direction lies turned out. Such land, if kept inclosed, improves; otherwise not. Slopes wash seriously; valleys much injured. A little hillside ditching is done with tolerable success.

JOHN PEARSON AND C. M. DAVIS (eastern part of the county, Beech river lands).—Hillsides are sandy and very productive. The lands lying between the hills cover from 20 to 200 acres in a body. The uplands are generally black sandy, with red clay subsoil, and are easily cultivated in cotton. With good seed it never fails to have a stand. Fresh land will make three-fourths of a bale to the acre. Cotton on lowland generally matures, but sometimes the last-formed bolls are killed by frost. The soils are: (1) Upland black sandy, with red clay subsoil, best adapted to cotton; (2) second bottom, best adapted to corn. The first, the upland black sandy, is 6 inches thick. Tillage is easy in wet and dry seasons. The land is early, warm, and well drained. The chief crops are corn and cotton. One-half is planted in cotton. Plants grow to 3 and 4 feet, 4 feet being the best, and are restrained in a wet August by topping. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,660 pounds being required for a 475-pound bale; staple rates well. After four years' cultivation the product is 800 pounds, the same as above making a bale; staple not quite so good. The weeds are crab-grass and foxtail. One-fourth of the land lies turned out. When not gullied, would produce well again if manured. Slopes wash seriously; valleys damaged 25 per cent. Horizontalizing and hillside ditching have been done with complete success.

T. M. STUBBLEFIELD AND R. J. DYER (southeast from Lexington Cane Creek lands).—The soils cultivated in cotton are: (1) Black bottom, the best cotton land; (2) second bottom, good for cotton; (3) dark uplands with more or less clay. The black bottom soil is the chief, forming one-half of our lands, and occurring 5 miles east and west and 15 or 20 miles north and south. It is a fine, sandy clay loam, 12 inches thick, early, warm, and well drained, and about one-third is planted in cotton. Plants grow to 4 and 5 feet, and if too rank in wet weather in July and August they are restrained by topping and running around with a suitable plow. Seed-cotton product per acre on fresh land is from 1,100 to 1,500 pounds, 1,545 pounds making a 475-pound bale. Staple rates as good middling. The weeds are grass and cocklebur. About one-twentieth of the land is turned out, which would produce as other poor lands after the first year if taken in again. Soil washes on slopes, but not seriously; valleys injured thereby but little. Horizontalizing and hillside ditching have been done with good success.

F. G. ROGERS (southeastern part of county, lands of Cane and Flat creeks, waters of Beech river).—The soils cultivated in cotton are: (1) Light sandy of creek bottoms, above overflow; (2) yellow sandy upland on slopes, from 20 to 30 acres in places; (3) light sandy of Beech river. The chief soil, the light sandy of the bottoms, is in large proportion. The soil of the uplands is much the same, and has an average thickness of from 4 to 5 inches. The subsoil is a yellowish, sandy clay, which crumbles on exposure and mixes kindly with the soil, underlaid in places by sand or gravel, or rock, at 4 and 5 feet. Tillage of lower lands is difficult in wet seasons. Second bottoms are best for cotton. Plants grow to 3 and 5 feet, and topping is resorted to in wet seasons if necessary. Seed-cotton product on fresh second bottoms 1,300 pounds per acre, 1,425 pounds making a bale; staple first quality. After four years' cultivation the product is from 800 to 1,000 pounds per acre if gathered early, and the staple is better. The weeds are crab-grass and cocklebur. Not much of this land lies turned out; and when taken in again, it would produce from 500 to 700 pounds per acre.

P. B. MCNATT AND A. H. FARNSWORTH (southeastern part of the county, lands of Hurricane and Middleton creeks, waters of the Tennessee river).—Cotton on the lowlands of Hurricane creek, based on greensand, is later and liable to be caught by frost; on the more sandy lands of Middleton creek it is earlier. Sandy bottoms are generally preferred; but if devoted to cotton, corn will have to be bought. The soils cultivated in cotton are: (1) Dark shell soil of Hurricane bottoms above overflow; (2) red upland, mostly in patches on slopes; (3) light and gray sandy bottom of Middleton creek. The first, the *dark shell soil*, forms about one-half of our lands on both lowland and upland, and occurs a long way north and south. White oak is a common growth. Thickness 10 inches. Subsoil, a tough red clay, which bakes hard when exposed, but crumbles to soil on cultivation. This soil is impervious when undisturbed, and contains fossil shells in places. Tillage is difficult in wet seasons, but not in dry. The soil is early, warm, and well drained. The crops are corn and cotton, some oats, and little wheat. The land is best adapted to corn, but makes fair cotton; and wheat does well when sown early. Nearly one-half of the crops is cotton. The plant grows to 3 and 5 feet, the latter the best. I know no remedy for plants going to weed. Seed-cotton product per acre on fresh land is from 500 to 700 pounds, 1,545 pounds making a bale of 475 pounds; staple good ordinary. On land cultivated for three years the product is from 800 to 1,000 pounds; the staple is then from one-half to a grade better, due to handling. The weeds are horse-weed and cocklebur. One-twentieth of the land lies turned out; if taken in again, produces according to wear and management. The slopes wash to some extent, and valleys are injured thereby 50 per cent. Annual efforts are made at horizontalizing and hillside ditching with moderate success.

The *red upland soil*, forming about one-third of cultivated lands, is a clay loam with little sand, 2 inches thick, which reddens with wear. The subsoil hardens in the sun, but mixes slowly with the soil; impervious when dry, and contains gravel in some places. Tillage is difficult in wet seasons, but easy in dry. Land is early when well drained, and is best adapted to cotton. About two-thirds of the crops are cotton. Plants grow to 1 foot and 2 feet high. Seed-cotton product per acre on fresh land is from 300 to 500 pounds, and about 1,545 pounds are needed for a 475-pound bale; staple good ordinary. On land cultivated three years the product per acre is from 500 to 700 pounds, 1,545 pounds, as before, making a bale; staple generally better. Weeds are rag-weed, crab-grass, and some cocklebur. One-third of the land lies turned out and is not reclaimed. Slopes wash seriously in places to the ruin of the valleys.

The *gray sandy soil* of Middleton creek forms about one-fourth of our lands, and occurs in a belt 2 miles wide along the course of the creek for a long distance; thickness 10 inches. Subsoil does not bake so hard, and mixes readily with the soil; contains some pebbles in places. Tillage is easier than in case of other soils. Land is early and well drained, and is best adapted to corn. About one-third of the crops is cotton. The weeds are smart-weed, cocklebur, and crab-grass. In other respects this soil is like the first.

McNAIRY.

Population: 17,271.—White, 14,845; colored, 2,426.

Area: 690 square miles.—Woodland, all, excepting an inconsiderable aggregate of marly and glady places; "bald knobs" in the southern and eastern parts of the county.

Tilled lands: 78,800 acres.—Area planted in cotton, 23,135 acres; in corn, 33,501 acres; in wheat, 6,726 acres; in oats, 5,093 acres; in tobacco, 95 acres.

Cotton production: 9,419 bales; average cotton product per acre, 0.41 bale, 579 pounds seed-cotton, or 193 pounds cotton lint.

McNairy is the most southerly of the summit counties, and is one of the southern tier lying contiguous to the state of Mississippi. It is rectangular and regular in form, its longer dimension extending north and south. The ridge or belt of highlands dividing the waters of the Mississippi from those of the Tennessee runs nearly straight, north and south, through the county, and has such a position as to throw the county into two very unequal portions, a larger and western one, drained by tributaries of the former river, and an eastern one, supplying headwaters for creeks emptying into the latter. The western slope affords much level or undulating table-land. To the southwest it is dissected and made more or less rolling or hilly by tributaries of the Hatchie river. Around Purdy, the county-seat, the country is more or less hilly. This town is on the border of an elevated area of the county northwest of the center, within which are the beginnings of many streams flowing off severally in opposite directions: to the northwest, waters of the South Fork of the Forked Deer; to the southwest, those of the Hatchie; to the east, those of the Tennessee.

The soils of the western portion are generally brown, siliceous, or sandy loams, mellow and productive, and well suited to the culture of cotton and corn. Fine level tracts, with numerous and fertile branch bottoms and gentle slopes, desirable farming regions, occur in the more western, northern, and southern parts of the county. Then again, at intervals, are sections of thinner uplands, denominated "barrens", with a growth of small oaks and hickories. Sandy lands make also a part of the eastern portion, and with them are many areas of darker and stiffer soils, based on the so-called "joint clay". The latter occur, too, on the dividing highlands in the southern part of the county. The belt of country including the stiffer soils begins with the Mississippi line, covering there the eastern half of the county, and extends a little east of north, through McNairy and the northwestern part of Hardin, into Henderson county.

Taking the whole county, the deep formations are mostly strata of sands, or of sands finely laminated with thin papery layers of clay, the whole often dark with fossil leaves or plant remains. Below these is the great stratum of "greensand", outcropping (where not covered by the superficial drift mentioned below) throughout the belt of the darker and stiffer soils referred to above, and supplying by natural changes the "joint clay" subsoil upon which they rest, and, where soils are absent, the "shell glades" and "bald knobs" of the southeastern and eastern parts of the county. (See also under Black Prairie Belt, page 21.) The deep formations, however, are often covered and concealed by the sands and sometimes gravel of the orange-sand drift. The mellow siliceous soils come chiefly from the latter. The "greensand" is less covered than the others, and is the surface stratum in many sections. The growth of best uplands and second bottoms includes white, red, and black oaks, hickory, dogwood, poplar, and beech, with elm, ash, papaw, red-bud, and some walnut, buckeye, and others. White, black, post, and black-jack oaks, with scrubby hickories, are common on the thinner uplands. The chief crops are corn, cotton, wheat, and oats, together with some rye, sweet and Irish potatoes, tobacco, and grasses. Most of the area of the county had in 1879 from 1 to 5 per cent. of total acreage planted in cotton. Much of the western and northwestern parts, and a strip running across the southern part, had more than this, from 5 to 10 per cent. Cotton is shipped by rail to Mobile and other places at from $2 50 to $3 per bale.

ABSTRACTS FROM REPORTS.

A. W. STOVALL (county generally).—The soils cultivated in cotton are: (1) Brown sandy, in hickory and hazel-branch valleys, on slopes, etc.; (2) second bottom; (3) creek bottom. The *brown sandy soil* forms one-third of the cotton lands, is varied in character, and occurs in all sections of the county, excepting to the southeast. The growth is hickory, black-jack and black oaks, etc. The chief crops are cotton and corn, but the land is best adapted to cotton, which forms about one-half of the crops, but the plants hardly average 3 feet in height. The seed-cotton product per acre on fresh land is 1,000 pounds, from 1,485 to 1,600 pounds, with toll paid, making a bale; staple middling. After a few years' cultivation the product is greater, and the staple rates as good middling. Much of the hillsides lies turned out, and only last eight or ten years if not protected. (None of first and second bottoms are turned out.) Land turned out, if allowed to improve, does well; and if manured, does as well as ever. The soil washes considerably on the hillsides, but the valleys are not much injured. Hillside ditching is practiced successfully.

The *second bottom soil* exists in considerable amount, though the aggregate is small in proportion, being confined to a few sections of the county. The growth is white oak, hickory, beech, etc. Tillage is difficult in wet seasons, but less so in dry. The land is tolerably early; partly well drained, partly not. Cotton forms about one-fourth of the crops. Plants grow to 3 and 5 feet high. Topping is done by some when necessary. Seed-cotton product per acre on fresh land is from 1,000 to 1,200 pounds, the same quantity as before making a bale.

The *creek bottom soil* exists in considerable amount, but cotton is not generally raised upon it. The growth is white oak, gum, beech, etc.

W. J. SUTTON AND J. G. COMBS (southeastern part of the county and east of Purdy).—The larger portion of cotton is grown on lowlands, which yield greater than other lands, though frost sometimes is damaging. The soils cultivated in cotton are: (1) Black limy (greensand soil) bottom land, lying, respectively, south of Snake creek and east of Lick creek; (2) dark gray bottom lands of the same creeks, north of the former and east of the latter; (3) brown sandy loam of uplands. The *black limy bottom land* occurs in small proportion, extending 3 miles east and 6 miles north. The growth is gum, ash, hickory, poplar, black oak, and papaw. The soil is black and putty-like when wet, and the subsoil is a tough, dark yellow clay, which becomes like the soil on exposure, is impervious when undisturbed, and contains limy matter and fossil sea-shells, underlaid by sand at 20 feet. Tillage is rather difficult in wet seasons, but less so in dry. The chief crops are cotton, corn, wheat, oats, sweet and Irish potatoes, sorghum, clover, and grasses. The soil does well for all excepting sweet potatoes. Cotton forms one-fourth of the crops. Plants grow to 5 and 6 feet, but are best at 4 feet. They grow rank when wet and the land is too fresh, and are restrained by topping in July and August. The seed-cotton product per acre on fresh land is from 1,000 to 1,200 pounds, 1,425 pounds making a bale of 475 pounds; staple middling. On land cultivated for ten years the product is from 900 to 1,000 pounds per acre, 1,545 pounds making a bale; staple not so long. The weeds are cocklebur and smart-weed. Very little land lies turned out, but such land would produce well again.

The *dark gray soil* forms about one-third of the lands. The growth is gum, beech, white, and black oaks, hickory, and poplar. The soil is a gray loam, with some sand, from 3 to 10 inches thick; the subsoil a light yellow clay, impervious when undisturbed, and underlaid by clay at 5 feet. The land is best adapted to corn, cotton, and grasses. One-fourth of the crops is cotton. Seed-cotton product per acre is less by 200 pounds than on the first soil.

The *brown sandy loam* of the uplands described above forms the larger proportion, 85 per cent. of all, and the growth is chiefly black-jack, white, black, and post oaks, hickory, poplar, and hazel; thickness from 3 to 8 inches. The subsoil is a red sandy clay, underlaid by sand and some gravel at 20 feet. One-fifth of the crops is cotton. The seed-cotton product on fresh land is from 900 to 1,000 pounds per acre, 1,425 pounds making a bale of 475 pounds. Staple is middling. Slopes wash seriously, and the valleys are damaged thereby. Horizontalizing and hillside ditching are practiced with success.

J. H. MEEKS (eastern part of the county generally).—Farmers chiefly fear early frost in the fall, which, however, rarely occurs. The soils cultivated in cotton are: (1) Dark brown alluvial, mixed with sand of first bottoms, very productive; (2) lighter brown of second bottoms, less productive; (3) light gray, with sand of uplands or "barrens", productive when fresh. The *dark brown alluvial* is the chief soil, and forms one-fourth of the first and second bottoms. It extends north many miles, east to the Tennessee, south 12 miles to the state line, and west 2 or 3 miles. The growth is oak, poplar, gum, maple, beech, ash, walnut, mulberry, red-bud, dogwood, etc. The soil is a fine sandy clay loam, 7 inches thick. The subsoil is light yellow and friable, intermixed with fine sand, and underlaid by gravel at 18 feet. The land is early and warm, partly well and partly ill drained, and is best adapted to corn. Two-thirds of the crops is cotton. Plants average 3½ feet in height, and when growing rank are restrained by shallow and little plowing. The seed-cotton product per acre on fresh land is 1,200 pounds, 1,545 pounds or less making a 475-pound bale. All our cotton rates well when clean. On land cultivated for five years the product is less by 200 pounds per acre, 1,485 pounds making a bale; staple is better, when there is any difference. Crab-grass is the pest of the cotton-growers. One-twentieth of the land lies turned out, but not so much so as formerly. Considerable has been taken in, which produces well where not at first too much exhausted. Slopes do not wash badly. Some little hillside ditching is done with good success.

The second soil is a fine sandy loam of a lighter color from 3 to 6 inches in depth, and having the same extent as the first soil. The subsoil is a reddish clay, mixed with fine sand, friable, and underlaid by sand and gravel at 18 feet. Land is easily worked until very old, and is best adapted to corn, though cotton grows well. Cotton forms perhaps two-thirds of the crops. Plants grow to an average height of 2½ feet, and this is the best. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,425 pounds making a bale of 475 pounds, and the staple rates well. On land cultivated five years the product is 800 pounds per acre.

The *light gray soil* of the "barrens" makes one-half of our lands, and extends throughout the county. The growth is black-jack, black, Spanish, and post oaks, hickory, dogwood, etc. The soil is from 2 to 4 inches deep. The subsoil is reddish and friable, contains sand, and

is underlaid by sand and gravel at 16 feet. The land is best adapted to corn. Cotton form two-thirds of crops, and grows to a height of 2 feet. The seed-cotton product per acre on fresh land is from 500 to 700 pounds, and the staple is as good as any. Slopes have not washed to any serious extent.

B. M. TILLMAN, J. H. ROWSEY, S. PLUNK, AND F. E. MILLER (northwestern and northern part of the county, Sweet-lips creek and waters of the Forked Deer river).—The climate is not so well adapted to cotton as the land, as the seasons are often too short. The black fine sand is the chief cotton soil. One-half its crops is cotton. Plants grow to 3 and 4 feet in height, 3 feet being the best. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,425 pounds making a bale of 475 pounds; staple middling. On land cultivated ten years the product is 600 pounds; but if manured the product may be from 1,600 to 1,800 pounds per acre. Crab-grass and foxtail are the only seriously troublesome weeds. A small proportion of the land lies turned out. Soils wash seriously on slopes, and the valleys are more or less injured. We check it by plowing on a dead level; have no hillside ditches.

The second soil, that of well-drained second and branch bottoms, produce per acre, when fresh, 800 pounds of seed-cotton, 1,425 pounds making a 475-pound bale; staple rates middling. After ten years' cultivation the land produces 600 pounds, but if manured, from 1,000 to 1,500 pounds; staple better, if there is any difference.

The gray uplands form the greatest portion, if woodlands are included. Black-jack, red, post, black, and Spanish oaks, and scrub hickory are common on these lands. The soil is 3 inches thick. One-half of the crops is cotton. The seed-cotton product per acre on fresh land is from 600 to 800 pounds per acre, 1,425 pounds making a 475-pound bale. The staple is middling when gathered early. On land cultivated ten years the product is from 600 to 800 pounds per acre. One-fourth of the land lies turned out, and is seldom taken in again unless lying well.

R. D. ANDERSON (southwest from Purdy; Oxford's creek, waters of Hatchie river).—Our best lands are branch and small valley lands on creeks. Hill land is being abandoned. Bottoms are preferred for cotton, and with a fair season will produce per acre three times as much as hillsides; yet the latter will make some cotton, even in wet weather. I may note as a fact that open blooms, wet by rain in the morning, never mature. The important cotton soils are those of bottoms or valleys, as follows: (1) Mulatto, sandy front-lands; (2) gravelly or buckshot back-lands. The *mulatto front-lands* is the chief soil, forming half the bottoms, the buckshot being the other half, and both together form an area three-fourths of a mile wide and 5 miles long. The soils of both average about 6 inches in depth. The subsoil of the first is sandy, leachy, and a brighter mulatto than the soil. The first soil is easily tilled in dry seasons, and in wet if well drained, and should be plowed when dry, but before becoming too dry; is late, but warm if well drained. The chief crops on both soils are corn, cotton, wheat, and oats, with some clover, millet, and herd's-grass. From one-third to one-half is planted in cotton. On first soil, the most productive, cotton grows to 4 feet. Plants become rank if wet in July and August, and there is no remedy. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,545 pounds making a 475-pound bale, including 24 pounds for bagging and ties; the staple is very fine. On land worked ten years the product is 800 pounds, 1,425 pounds making a bale; staple not quite so good. The weeds are crab-grass, cocklebur, and smart-weed. None of the valley land lies turned out. Land is sometimes seriously injured by washings from slopes. All thrifty farmers practice horizontalizing and hillside ditching, and with satisfactory results.

The *gravelly or buckshot* soil rests upon a gravelly subsoil, continuing down much the same for from 2 to 6 feet, and is then generally hard-pan and impervious. Excepting for weeds, tillage is easy in wet and dry seasons.

HARDIN.

(See "Western valley of the Tennessee river".)

DECATUR.

(See "Western valley of the Tennessee river".)

BENTON.

(See "Western valley of the Tennessee river".)

HARDEMAN.

(See "Brown-loam table-lands".)

MADISON.

(See "Brown-loam table-lands".)

WESTERN VALLEY OF THE TENNESSEE RIVER.

This natural division, as limited in Part I, embraces much of Henry,* the greater parts severally of Benton, Decatur, and Hardin counties, a little of McNairy,* the northwestern corner of Wayne,* and the western parts of Perry, Humphreys, Houston, and Stewart. Stewart and Houston are outside of the cotton region proper, and are not described. Stewart reported fifteen bales as the cotton product of 1879, and Houston four bales; but most of the cotton raised in Stewart, and all of that in Houston, was from parts of the counties within the limits of the Highland Rim to the east. For statistics of these counties see tables I and II, in Part I.

HENRY.

(See "Summit region of water-shed".)

BENTON.

Population: 9,780.—White, 9,147; colored, 633.

Area: 380 square miles.—Woodland, all.

Tilled lands: 46,425 acres.—Area planted in cotton, 4,923 acres; in corn, 24,788 acres; in wheat, 4,600 acres; in oats, 2,368 acres; in tobacco, 389 acres.

Cotton production: 1,801 bales; average cotton product per acre, 0.37 bale, 522 pounds seed-cotton, or 174 pounds cotton lint.

The Big Sandy and the Tennessee rivers both flow in northerly directions, gradually approaching, until they meet at an acute angle not far south of the Kentucky line. In the angle thus formed the long and narrow county of Benton is situated, placed, as if thrust in from the south, with its sharp northern end foremost. The Tennessee bounds it on the east and the Big Sandy for much of the distance on the west. It thus happens that Benton is chiefly a water-shed between two rivers. Its eastern margin, having a length along the river of 50 miles or more, is mostly made up of the rich alluvial bottoms of the Tennessee, averaging for the entire length nearly a mile in width. On the other side, for half the length of the western boundary, the bottoms of the Big Sandy make the western margin. The remainder of this boundary is a straight line running from a point on the Big Sandy directly south. The southwestern corner of the county is thus thrown out of the valley of the Big Sandy, and exceptionally upon the uplands of the water-shed.

The upland belt between the rivers has a varied surface, much of which is sandy, undulating, moderately fertile, and hilly. It is traversed by a multitude of creeks, some of large size, their valleys affording in the aggregate a great amount of good land. It must be noted that the "old shore" line spoken of on previous pages, or the junction of the hard rocks of Middle Tennessee with the soft strata of West Tennessee, passes through Benton. (See page 13, under "Outline of physical geography", and also under "Western valley of Tennessee river".) The eastern part of the county, therefore, including its northern end, is based on hard rocks, flinty, siliceo-calcareous rocks, and limestones, which often show themselves in bluffs and in the beds of creeks. The western part, on the other hand, has to a great extent a basis of laminated clays and sands. Over nearly all, however, excluding the alluvium of the Tennessee and other large streams, are strewed, sometimes thinly, the sands, and often the gravels, of the orange-sand drift. Going toward the valley of the Big Sandy sandy rolling lands predominate. Approaching the bottoms of the Tennessee the country breaks away in bluffs and spurs, often with cherty, gravelly surfaces and soils.

The soils on the uplands are comparatively thin, but areas of rich brown loams occur. The growth is hickory, poplar, chestnut, black-jack, black, white, and other small oaks. The most important soils are those of the first and second bottoms and gentle slopes. The black alluvial lands of the Tennessee are very productive, and would be first-class cotton lands were it not for overflows in spring, which often seriously delay planting. The first bottoms of the Big Sandy are low and wet, but the second bottoms and "long slopes", with their brown, mellow, sandy loams, are favorite grounds for cotton-growers. The numerous creek and branch valleys contribute largely to the aggregate of cotton lands. The growth of valley land is elm, poplar, hickory, hackberry, black, and white oaks, sugar-tree, beech, papaw, and, in the bottoms of the larger streams, cypress.

Benton is on the margin of the cotton region. On the map showing acreage in cotton it is divided nearly north and south into three belts. The western belt, in the southwestern part of the county, had in 1879 from 5 to 10 per cent. of its total area in cotton; the middle belt, a narrow one reaching farther north, from 1 to 5 per cent.; and the eastern, the larger part, extending through the entire length of the county, from 0.1 to 1 per cent. Cotton is shipped by rail to Nashville at $1 or to Louisville at $2 per bale.

ABSTRACT FROM REPORTS.

J. H. BRIDGES, W. F. MAIDEN, A. E. SWINDLE, AND P. M. MELTON (middle and northern parts of the county).—The soils cultivated in cotton are: (1) Dark gray of gently sloping upland; (2) dark loam of Sandy and Tennessee river bottoms; (3) flat-land soil, light-colored, and inclined to be stiff. The *dark gray soil* forms one-fifth of our lands. It is a clayey loam 5 inches thick. The subsoil bakes in the sun, but crumbles and mixes readily with the soil; is impervious when undisturbed, contains gravel, and is underlaid by sand, gravel, or rock at from 1 foot to 3 feet. The land is early, warm, and well drained. The chief crops are corn, wheat, oats, cotton, tobacco, and potatoes, but the land is best adapted to corn and oats. One-fifth of the crops is cotton. Plants in places reach a height of 6 feet, but produce best at 3½ to 4 feet. They may overgrow when planted late and the season is wet, for which topping is advocated by some as a remedy. The seed-cotton product per acre on fresh land is 600 pounds, 1,660 pounds being required for a 475-pound bale; staple is ordinary. On land cultivated five years the product is 400 pounds; staple heavier, though shorter. The weeds are hog-weed, rag-weed, and crab-grass in wet weather. One-fifth of the land lies turned out, and if taken in again would produce well if manured. Slopes wash seriously in places; the valleys are not generally injured thereby, but very often are improved. Some horizontalizing and hillside ditching are done, with good results.

A. C. PRESSON (county generally.—For kinds of soils, etc., see page 24, Part I, under "Western valley of the Tennessee river").—The first soil, the *black sandy* of bottoms, is easily tilled in dry seasons, but with difficulty in wet. The crops are corn, wheat, cotton, tobacco, oats, potatoes, and peanuts. The land is best adapted to corn, cotton, and tobacco. About 2 per cent. of the cleared land is planted in cotton. Plants grow to 3½ feet, and are best at that. Cotton on fresh land in wet seasons may run to weed, and some restrain it by topping. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,570 pounds making a bale of 475 pounds; staple rates good. On land in cultivation ten years the product is 500 pounds per acre, 1,580 pounds making a bale; staple a little different. The weeds are crab-grass and cocklebur. No land lies turned out.

The second soil, the *black sandy of level uplands*, is a sandy clay loam 5 inches thick, easily tilled in dry and wet seasons; is early, warm, well drained, and is planted in cotton to the extent of 20 per cent. Plants grow to 3 feet, and are best at that. Seed-cotton product on fresh land is a little less than on first soils. Other points are as under first soil.

The third soil is the *yellow sandy* of rolling uplands. Subsoil on hillsides is sand; on tops of hills and level portions, yellow clay. The land is early, warm, and well drained. Most of the crops are cotton. Plants grow from 2½ to 3 feet high, the latter the best. The seed-cotton product per acre on fresh land is 800 pounds, 1,575 pounds making a 475-pound bale; staple rates well. On land worked six years the product is 500 pounds, 1,580 pounds making a bale. Chief weed, crab-grass. One-fourth of the land is turned out. Hilly lands, when once turned out, are never taken in again. Slopes wash seriously, but the valleys are but little damaged thereby. Horizontalizing and hillside ditching are practiced with very good results.

DECATUR.

Population: 8,498.—White, 7,276; colored, 1,222.

Area: 310 square miles.—Woodland, all, excepting a limited aggregate of marly limestone glades.

Tilled lands: 37,861 acres.—Area planted in cotton, 5,591 acres; in corn, 19,985 acres; in wheat, 3,829 acres; in oats, 2,701 acres; in tobacco, 59 acres.

Cotton production: 2,169 bales; average cotton product per acre, 0.39 bale, 552 pounds seed-cotton, or 184 pounds cotton lint.

Decatur county has a long, narrow, rectangular form, its length being more than three times its width. It lies lengthwise north and south, and is bounded on two sides (the eastern and southern) by the Tennessee river. The "old shore" line, or the junction of the soft strata of West Tennessee with the hard rocks of Middle Tennessee (see page 13, under "Outline of physical geography", and also under "Western valley of the Tennessee river"), runs longitudinally through the county, splitting it into a western, sandy, and higher belt, and an eastern, rocky, and lower one. The western belt is indeed the eastern border of the great sandy plateau slope of West Tennessee. Its high areas, table-lands, rolling lands, and hills supply the headwaters of many creeks flowing into the Beech and the Tennessee rivers. The Beech itself, rising farther west, flows eastward directly across both belts of the county. The rocky, or eastern, belt falls away to the bottoms of the Tennessee, though ridges continuous with the western highlands often run eastward a long way toward the river. The prevailing rocks off the ridges are limestones, often cherty, several beds of them marly, and forming at numerous points marly, glady places, destitute, or nearly destitute, of native growth. At the tops of the ridges are layers of flinty and calcareo-siliceous rocks, such as cap the high flat table-lands of Middle Tennessee east of the Tennessee river. Over all the strata of the county, alluvial bottoms excepted, the sands and gravels of the orange-sand drift have been deposited more or less continuously. In the western belt its sands prevail and cover the deeper strata to great extent; in the eastern, gravel is common, and the deposits are broken and occur at intervals. Here on high ridges beds of gravel, sand, and *débris* are met with. In such masses, at a number of localities, exist accumulations of iron ore of economic interest.

The chief soils may be grouped as follows: First, the dark alluvial of the rivers and larger creeks, of which there is a full share, with a native growth of white oak, poplar, hickory, ash, sweet and black gum, beech, walnut, sugar-tree, and elm, with cypress in the swampy back-lands; secondly, the brown sandy loams of the second bottoms, slopes, and branch valleys, with sandy or gravelly, or clayey subsoils, and a growth of oaks chiefly, with beech, hickory, walnut, and gum; and lastly, the thinner sandy soils of flat and hilly highlands, on which grow hickory, post and other oaks, and sometimes chestnut. Calcareous, clayey soils, based on limestones, are found in the eastern and southern portions. The Tennessee river washes the borders of the county for nearly 50 miles, and the bottoms occur along much of this distance. These bottoms are often more than a mile wide, and sometimes extend back 2 miles from the river. Then again they are narrowed and cut off by the running in of the highlands. Many of them present the characteristic features of "front-lands" and of lower, swampy, and cypress "back-lands". They must average for the whole length of the river not much, if any, less than 1 mile, the "front-lands" supplying an exceedingly valuable body of land.

The crops are those given at the head of this description, together with sorghum, peanuts, rye, pease, grasses, and potatoes. All the lands, excepting marshy lands, are cultivated more or less in corn and cotton, to which they are best adapted. The larger part of the county had in 1879 from 1 to 5 per cent. of its total area planted in cotton; but a strip in the southwestern part of the county, contiguous to the western boundary, had more, from 5 to 10 per cent., and the northeastern corner less, from 0.1 to 1 per cent. (See map of relative acreage in cotton.) Cotton is shipped, by river or rail, to Louisville or Cincinnati at from $1 to $1 50 per bale.

ABSTRACTS FROM REPORTS.

J. H. PEARCY, L. D. CRAWLEY, AND J. MCMILLAN (county generally).—Cotton is a sure crop, and brings ready money. Women and children can work at it, which is a consideration. (For kinds of soil, etc., see Part I, under "Western valley of the Tennessee river".) The subsoil of the fresh sandy land is yellowish and reddish. On this soil plants grow to 3 feet, the best height. Topping about the 1st of August is practiced when plants run to weed on fresh land in wet weather. The seed-cotton product per acre on fresh land is 800 pounds, 1,485 pounds making a 475-pound bale; staple rates middling. On land worked five years the product is from 500 to 600 pounds for a few years, 1,600 pounds making a bale; staple not quite so good. Crab-grass is the pest. Ten per cent. of the land lies turned out. Horizontalizing and hillside ditching have been done with success in most cases.

On the *black sandy soil* on the river cotton grows from 2 to 6 feet in height, the highest being the most productive. Wet seasons incline the plant to become weedy, which is restrained by topping by the last of July or in August. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,600 pounds making a 475-pound bale; staple brought last season (1879) 12 cents. After the first year's cultivation the product is about the same; staple somewhat better. The weeds are crab-grass and cocklebur. Very little land, say one-thirtieth, lies turned out. The slopes wash seriously, and the valleys are injured thereby 5 per cent. Very little is done to check the damage.

The *black and clayey soil* on the creeks is early, warm, and tolerably well drained. Cotton grows to 2 and 5 feet, but is best at 3 feet. The seed-cotton product on fresh land is the same as on first soil; staple middling. On land cultivated six years the product is 800 pounds per acre, 1,545 pounds making a bale; staple good ordinary. The valleys are injured by washing of slopes 25 per cent. Other items as under first soil.

On the *hilly, clay loam* the growth is oak and hickory; depth of soil, 4 inches. Cotton grows to 2 feet. The seed-cotton product per acre on fresh land is 500 pounds, 1,660 pounds making a bale; staple good ordinary. After four years' cultivation the product is 200 pounds; staple not so good. Crab-grass is troublesome. One-fourth of the land lies turned out, and if taken in again would produce very poorly. Valleys are injured 25 per cent. by the washing of slopes. Other items as above.

W. H. BOGGAN, J. F., W. R., AND R. J. AKIN, AND R. T. SIMMONS (southern part of the county, Stewman's Creek and Tennessee River lands).—Uplands vary in areas from 1 acre to 100 acres. Cotton in low, wet lands is late in spring, becomes lousy, and is often caught by early fall frost. The soils cultivated in cotton are: (1) Black bottom lands, in bodies of from 10 to 100 acres, partly subject to overflow; (2) upland, mulatto or yellow, above overflow; (3) hill- and table-land, sandy soil in patches. The *black bottom lands* form 40 per cent. of all, and occur 10 miles east, 12 west, 3 north, and 8 miles south. It is a sandy clay loam (putty-like in small patches) of alternating black, brown, and yellow colors. The subsoil is a tough yellow, dark red, and white clay, gradually becoming like the soil upon cultivation, is impervious when undisturbed, often contains gravel, and is underlaid by sand, gravel, or limestone (cement-rock) at from 2 to 12 feet. The land is easily tilled in dry seasons, but with some difficulty in wet, and is best adapted to corn and cotton. Fifteen per cent. of crops are cotton. Plants grow from 2½ to 6 feet; are best at 3 feet. Bolling is favored by the use of fertilizers. The seed-cotton product per acre on fresh land is 850 pounds, 1,720 pounds making a 475-pound bale; staple middling to middling fair. On land worked five years the product is 700 pounds, and if well manured 2,000 pounds, 1,600 pounds making a bale; staple not so long or fine. The weeds are crab-grass, cocklebur, smart-weed, and careless-weed. No land lies turned out. The slopes wash to no great extent. Some hillside ditching has been done with good success.

The *upland*, above overflow, which forms half the lands, extends off 8 or 12 miles in each direction, and is a clayey, often gravelly loam 6 inches deep. The subsoil is underlaid by sand or gravel, or limestone (cement-rock), at from 1 foot to 30 feet. Tillage is not usually troublesome in dry seasons, but is rather difficult in wet. (In other respects this soil is like first, with the exceptions below.) The seed-cotton product per acre on fresh land is 700 pounds; staple middling. On land worked five years the product is 650 pounds; if well manured, 2,000 pounds per acre. Two per cent. of the land lies turned out, and would produce, if taken in again, 600 pounds per acre.

The *hill- and table-land* forms 10 or 12 per cent. of the lands, and extends from 12 to 16 miles, bordering on heads of creeks and sand-hills. The growth is oak, hickory, poplar, chestnut, black gum, and sourwood. The soil is a sandy, gravelly clay loam of gray, yellow, or brown color, from 3 to 6 inches deep. The subsoil contains gravel at points of the hills, and is underlaid by sand and gravel and sand-rock at from 2 to 4 feet. The land is early, warm, and well drained, and is best adapted to cotton, which makes 4 per cent. of the crops. Plants grow to 18 and 30 inches, the latter the best. The seed-cotton product per acre on fresh land is from 400 to 600 pounds, 1,660 pounds making a 475-pound bale; staple middling. On land worked five years the product is from 300 to 450 pounds, 1,600 pounds making a bale; staple less fine and long, with a heavier coat on seed. Grass is the most troublesome. Five per cent. of the land lies turned out, and would produce from 250 to 500 pounds per acre if taken in again. The slopes do not wash badly, and the valleys are not injured.

D. M. SCOTT AND J. G. YARBOROUGH.—The yellowish, sandy soil of swells in the bottoms has a subsoil underlaid by sand and gravel at 50 feet. The tillage of soil in wet seasons is rather difficult, but is very easy in dry. The land is early when well drained. Cotton grows to 2 and 5 feet and higher; is best at 3 feet. Wet weather in July and August inclines the plants to run to weed, for which I know of no remedy. The seed-cotton product per acre on fresh land is from 1,000 to 1,500 pounds, 1,485 to 1,550 pounds, including bags and ties, making a 475-pound bale; staple good middling. On land under cultivation fifteen years the product is from 500 to 1,500 pounds, if manured to some extent; staple not differing essentially. The weeds are crab-grass, careless-weed and buffalo- or pig-weed. No land lies turned out.

HARDIN.

Population: 14,793.—White, 12,775; colored, 2,018.

Area: 610 square miles.—Woodland, all, excepting a limited aggregate of marly limestone glades.

Tilled lands: 72,446 acres.—Area planted in cotton, 12,859 acres; in corn, 30,909 acres; in wheat, 5,445 acres; in oats, 3,387 acres; in tobacco, 88 acres.

Cotton production: 5,345 bales; average cotton product per acre, 0.42 bale, 591 pounds seed-cotton, or 197 pounds cotton lint.

Hardin is the only county in the western part of the state that lies on both sides of the Tennessee river. The states of Mississippi and Alabama corner on its southern boundary at a point nearly bisecting the boundary, and where, too, the Tennessee river enters the state of Tennessee. The county is rectangular in form, its longer dimension lying north and south, and is greatly varied in its topography, rocks, and soils. Lying on both sides of the river, it presents, indeed, characteristics of both Western and Middle Tennessee. If we divide the county into four approximately equal belts by lines running north and south, the western belt or quarter will have for its geological basis stratified sands and the "greensand" stratum pertaining to McNairy and other western counties, while the other belts will be based on solid rocks, limestones, shales, and flinty strata, representing a number of much older formations. The line cutting off the western quarter thus coincides with, and indeed is, the "old shore line", of which I have before spoken. (See page 13, under "Outline of physical geography", and also under the "Western valley of the Tennessee river".) The Tennessee river coincides for a good part of its course with the same "shore line". Entering the county, with hard rocks on both sides, the river curves to the west until it reaches the "shore line", and then flows northward, with sandy bluffs on the western side and rocky ones on the eastern. At a point about two-thirds of the way through the county the river, bending to the northeast, leaves the "shore line" and enters the area of the hard rocks, escaping finally from the county at its northeastern corner. It thus happens that limestones are found in the extreme northern and southern parts of the county west of the Tennessee. In any section of Hardin, even upon the highest ridges of the eastern portion, scattered patches of the sand and gravel of the orange-sand drift may be met with resting upon all the deeper strata and rocks mentioned.

The Tennessee river, in bending as it does through the county, has a long immediate valley. This includes many rich bottoms, but is in the main rougher than we would look for in the valley of so great a stream. Going west from the river bottoms the country, though broken, has level areas interspersed, which rise into ridges between the creek valleys as we approach the western boundary. The soils west of the "shore line" are sandy, often mellow and fertile, and, in the northwestern part of the county especially, alternate more or less with the stiffer soils of the "greensand" formation. Going east from the river the country presents varied features, and in the southern part of the county the high table-lands of the Highland Rim are soon met with. East of Savannah there is an area of post-oak flatwoods resting upon sand and gravel.

Most of the northeastern part of Hardin is a rolling limestone region, supplying more or less good land, and in places marly glades, nearly naked, or spotted with clumps of small cedars. Within this section are several large creeks, with valleys of good land. East and southeast of the central portion are heavy, often flat-topped ridges, interlocked with narrow valleys. Farther to the southeast the country is chiefly high table-land, resting upon the great Highland Rim, with calcareo-siliceous, flinty, and sometimes cherty limestone rocks. The soils are thin, though better areas on the branches are interspersed. The main rim sweeps around from the Tennessee river, in the southern part of the county, northeasterly into Wayne. Many ridges in the northeastern part of Hardin are but spurs, in places reduced to lines of hills, running out westerly and northwesterly from the rim.

The chief crops are corn and cotton. For most of the county the acreage planted in cotton in 1879, as compared with total area, was from 1 to 5 per cent.; for the western third of the county, excepting a fraction at the southern end, it was more—from 5 to 10 per cent. Cotton is shipped to Cincinnati and Louisville at $1 50 per bale.

ABSTRACTS FROM REPORTS.

J. C. MITCHELL (northwestern part of the county, west of Tennessee river.—For remarks, kinds of soils, etc., see pages 24, 25).—On the first soil, black upland, lying on hillsides and branch bottoms, cotton grows to 2 and 5 feet in height, but is best at 3 feet. Wet seasons incline the plant to run to weed; topping is often done, and is said to be beneficial. Seed-cotton product per acre on fresh land is 700 pounds, 1,660 pounds making a 475-pound bale; staple low middling. On land cultivated five years the product on upland is from 300 to

400 pounds, and on bottoms 600 pounds, 1,545 pounds making a bale; staple about the same. The weeds are crab-grass and cocklebur. One-third of the land lies turned out, but if taken in again it would produce well. Slopes wash seriously, and valleys are considerably damaged thereby. Horizontalizing is done to a limited extent, and with good success so far as tried.

On the dark loam of the Tennessee River bottom cotton grows to 5 and 10 feet. The seed-cotton product per acre on fresh land is from 500 to 1,500 pounds, 2,140 pounds making a 475-pound bale; staple good ordinary. On land cultivated for five years the product is about the same, 2,010 pounds making a bale; staple of some rates low middling. The weeds are cocklebur and crab-grass. Land is only turned out when overflows wash it into gullies.

On the sandy bottom soil, near the river bank, cotton grows to a height of 5 or 10 feet. The seed-cotton product per acre on fresh land is from 1,000 to 1,800 pounds, 1,900 pounds making a bale of 475 pounds; staple middling. On land cultivated fifteen years the product and the staple are the same as on fresh land. Cocklebur is the troublesome weed. No land lies turned out unless gullied. Slopes gully readily, but nothing is done to check the damage.

J. W. IRWIN (central part of the county, east of Tennessee river).—On the black sandy soil of creek and river bottoms cotton grows to a height of from 3 to 7 feet, 5 feet being the best. To check growth in wet seasons thinning and topping are resorted to. Seed-cotton product per acre on fresh land is from 1,000 to 1,200 pounds, 1,660 pounds making a 475-pound bale; staple low middling. On land worked five years the product is about the same, as the roots are killed by that time, 1,600 pounds making a bale; staple finer but shorter. The weeds are island-weed, morning-glory, and cocklebur. Land is only turned out when washed. Slopes wash readily, but the damage is not serious, and is checked by permitting small undergrowth to take the land.

On the soil of second bottoms and slopes (so-called "ridge land") cotton grows to 2½ and 4 feet. Plants grow rank only in very wet seasons, and topping is rarely necessary on upland. The seed-cotton product per acre on fresh land is from 800 to 1,000 pounds, 1,660 pounds making a bale of 475 pounds; staple middling. On land cultivated five years the product is from 400 to 750 pounds, 1,600 pounds making a bale; staple finer. One-third of the land lies turned out; but if taken in again, and not washed, would produce well. The slopes wash seriously, and the valleys are injured thereby 25 per cent. Very little is done to check damage, our people not yet realizing the importance of saving and restoring land.

On the soil of the flatwoods cotton grows from 2 to 3½ feet, and rarely needs topping. The seed-cotton product per acre on fresh land is from 600 to 800 pounds, 1,600 pounds making a 475-pound bale; staple middling. On land worked five years the product is 400 pounds; staple finer. Weed crab-grass. One-half this land lies turned out; but if taken in again it would produce nearly as well as at first. Slopes wash seriously, and little is done to check the damage.

McNAIRY.

(See "Summit region of the water-shed".)

WAYNE.

(See "The Highland Rim".)

PERRY.

Population: 7,174.—White, 6,609; colored, 565.

Area: 400 square miles.—Woodland, all, excepting a small aggregate of marly limestone glades.

Tilled lands: 35,422 acres.—Area planted in cotton, 452 acres; in corn, 15,007 acres; in wheat, 3,113 acres; in oats, 1,461 acres; in tobacco, 29 acres.

Cotton production: 196 bales; average cotton product per acre, 0.43 bale, 618 pounds seed-cotton, or 206 pounds cotton lint.

Perry and the county contiguous on the north (Humphreys) contribute a long central portion to the eastern slope of the western valley of the Tennessee. Both counties have the Tennessee for their western boundary. Perry has Wayne to the south of it and Hardin to the southwest. The diagonal corners of Perry and Hardin would nearly touch but for the northwestern corner of Wayne, which is thrust between them and borders the Tennessee for a number of miles. Perry is approximately rectangular in form, nearly twice as long as wide, with the longer dimension north and south. Its topography is easily understood. Parallel with the Tennessee river, and running in the same direction to the north through the eastern part of the county, is Buffalo river, with a well-marked valley. Conceiving the county to be split into four equal belts by three lines running north and south, the most easterly line will mark the place of Buffalo river, throwing one-fourth of the county to the east of that stream, and the middle line will nearly coincide with a high ridge 300 or 400 feet above adjacent valleys, a "divide" between the waters of Buffalo river and the Tennessee. We say "nearly coincide", for the course of the divide lies a little east of the line and crowds upon the Buffalo valley, greatly narrowing its western slope. Half or more of the county forms a belt west of the divide. The county as a whole is thus seen to consist of parallel and unequal sections lying lengthwise within its bounds. The divide sends off numerous spurs westward toward the Tennessee river, arranged quite regularly, like teeth in a comb. Between these are many creek valleys, based on limestone, which widen as we descend toward the river, supplying many rich bottoms, with fair second bottoms and slopes. Reaching the river, we find at intervals along its course the characteristic alluvial lands, though the aggregate of these is less than on the western bank.

The western slope of the Buffalo valley, from the river to the divide, is narrow, with short, swift streams. The eastern slope is quite different. Within the limits of Perry, outside of the river bottoms, it shows the ends of many spurs jutting into the county from the east, and between them the lower parts of as many creeks flowing into the Buffalo. Curiously, the ends of the spurs are the ends of the teeth of another comby topography such as we have in the western half of Perry. The back of the second comb, or the second "divide", lies in sections of Hickman and Lewis, contiguous to Perry, and from it spurs (broad and flat-topped here for much of their course) extend off westward toward the Buffalo, as in the other case they do toward the Tennessee. Between these are many valleys, a good part based on limestone, which widen and supply bottoms and other good lands until the immediate valley of the Buffalo is reached. Both combs lie with their teeth in the same direction and their backs nearly parallel.

Buffalo and the creeks of the eastern portion all have valleys with a fair proportion of rich, mellow bottom lands. The slopes are generally in cultivation, supplying often very desirable farming tracts, with siliceous or

calcareous soils, based on clayey subsoils. The ridges are capped with siliceous rocks, the soils of which are thin and unproductive. As in other counties of this part of the state, patches of gravel of the orange-sand drift are occasionally met with.

The chief crops of Perry are corn, wheat, oats, and peanuts, with some cotton, potatoes, and tobacco. Cotton was once more largely cultivated than now. The census of 1870 gave 495 bales (400 pounds each) as the product of 1869; we have reported only 196 bales (475 pounds each). This falling off, amounting to 220 standard bales of 475 pounds each, is in good part due to the substitution of the culture of peanuts for that of cotton. On the map of acreage in cotton it is seen that three-fourths of the county had in 1879 less than 0.1 per cent. of total area in cotton. Most of the cotton was raised in the southern part. A strip on the southern boundary shows from 1 to 5 per cent.; another, next north, from 1 to 0.1 per cent.

HUMPHREYS.

Population: 11,379.—White, 9,708; colored, 1,671.

Area: 450 square miles.—Woodland, all.

Tilled lands: 53,938 acres.—Area planted in cotton, 155 acres; in corn, 26,387 acres; in wheat, 5,426 acres; in oats, 1,988 acres; in tobacco, 33 acres.

Cotton production: 90 bales; average cotton product per acre, 0.58 bale, 828 pounds seed-cotton, or 276 pounds cotton lint.

It is only the southern part of Humphreys county that can lay any claim, so far as actual products are concerned, to be within the cotton-growing region, and the claim for this part is a feeble one. The county lies north of Perry, and with it contributes, as stated in the description of the latter county, a long central portion to the eastern slope of the western valley of the Tennessee river. The Tennessee bounds it on the west. Its middle and eastern parts are mainly high table-lands, forming a section of the great Highland Rim of Middle Tennessee. We may say, in fact, that the whole county is an elevated table-land, sloping off on the west as it approaches the lowlands of the Tennessee river, and is channeled throughout by water-courses running more or less westerly. Its southern part is cut across by the curving valley of Duck river, with which, coming from the south, Buffalo valley unites. Large creeks rise in the eastern and northeastern parts of the county and beyond the boundary, in the margin of Dickson county, next east, of which some flow southwestward into Duck river, and others westward into the Tennessee. The latter widen as they approach the river.

The valleys supply substantially the productive lands. The bottoms and gentle slopes of the creeks, based on calcareo-siliceous rocks, sometimes on limestones, and often on cherty gravel, are usually mellow siliceous loams, and are everywhere in cultivation. The valleys of Duck and Buffalo rivers, in which most of the cotton is raised, have bottoms, some of large size, noted for their mellowness and fertility. In addition, the Tennessee river, washing the western side of the county for 30 miles, contributes a large and important quota of dark sandy alluvium. The native growth of the valleys is heavy, and includes many species, among which white, black, and red oaks, poplar, walnut, sweet gum, hickory, ash, and beech may be mentioned. The leading crops are corn, peanuts, wheat, and oats, but some attention is given to rye, tobacco, potatoes, clover, and grasses. Peanuts take the place of cotton as a ready-money product. The table-lands are chiefly in open woods, often denominated "barrens", and are very sparsely settled—for miles not at all. They have thin soils, little productive. The growth is black, red, white, post, and Spanish oaks, hickory, dogwood, and black gum, with sometimes black-jack, chestnut, and occasionally poplar. On the map of relative acreage planted in cotton in 1879 the southern part only is regarded, and there the acreage in cotton is represented as less than one-thousandth of the total area. Cotton is shipped to Cincinnati at $1 50 per bale.

ABSTRACTS FROM REPORTS.

W. J. WHITE AND W. D. KING (southern part of the county).—But little cotton is planted. The peanut crop is the most important, farmers resorting to it after enough corn and wheat are planted to supply bread. The kinds of soil cultivated in cotton are: (1) Bottom; (2) upland and second bottom. One-third of all our lands is good for cotton. On the first soil cotton grows to 3 and 6 feet high, but is best at 4 feet. Wet seasons and soils too rich cause plants to grow rank, for which I know of no remedy. The seed-cotton product per acre on fresh land is from 800 to 1,500 pounds, 1,780 pounds making a 475-pound bale. Staple rates low middling to middling. Culture of cotton injures the land but little. The weeds are rag-weed, smart-weed, purslane, careless-weed, and crab-grass. Little, if any, of this land lies turned out.

The upland and second bottom soil forms one-half the cultivated lands, and occurs up and down the valleys of Duck and Buffalo rivers. It is a fine sandy and gravelly loam of a gray, yellowish, or blackish color, from 3 to 12 inches thick. Cotton grows upon it 3 and 6 feet high, 4 feet being the best. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,780 pounds making a bale of 475 pounds; staple rates as low middling. No land worth noting lies turned out. The slopes do not wash seriously, and not much effort is made to check the damage.

THE HIGHLANDS, OR HIGHLAND RIM OF MIDDLE TENNESSEE.

In Part I, under the head of "The Highland Rim", this natural division is considered to consist of two parts, a western and an eastern, and the counties included, or partly included, in each were enumerated. Under the same head the character of the division as a cotton-producing area is noticed.

HIGHLAND RIM (WESTERN SUBDIVISION).

This subdivision embraces all or parts of Hardin,* Wayne, Lawrence, Lewis, Perry,* Hickman, Humphreys,* Dickson, Cheatham, Robertson, Montgomery, Stewart, Giles,* Maury,* Williamson,* Sumner,* and Davidson.* The counties of Dickson, Cheatham, Robertson, Montgomery, and Stewart are outside of the cotton region proper, or in the "penumbral region" of cotton culture. Montgomery and Cheatham produced in 1879 but 2 bales each, Dickson 31 bales, and Robertson none. The cotton reported from Houston, 4 bales, and much of that from Stewart, 15 bales, was from lands within this subdivision. (For the statistics of these counties see Tables I and II in Part I.) These "penumbral" counties are not separately described, and the reader is referred to the general descriptions of the regions represented in each.

HARDIN.

(See "Western valley of the Tennessee river".)

WAYNE.

Population: 11,301.—White, 10,232; colored, 1,069.
Area: 710 square miles.—Woodland, all.
Tilled lands: 56,456 acres.—Area planted in cotton, 3,265 acres; in corn, 25,674 acres; in wheat, 8,791 acres; in oats, 2,109 acres; in rye, 505 acres; in tobacco, 63 acres.
Cotton production: 1,207 bales; average cotton product per acre, 0.37 bale, 528 pounds seed-cotton, or 176 pounds cotton lint.

Wayne county, resting upon the southern boundary of the state, is a characteristic county of the Highland Rim, to which division it all belongs, excepting its northwestern corner. The part excepted is washed by the Tennessee river for 10 miles or more, and contains a fair proportion of alluvial lands, and back of the bottoms there is much rolling limestone, often glady land. In the main the county is a high, flat table-land from 800 to 1,000 feet above the sea. Within its central portions are the headwaters of numerous creeks, which flow in all directions. The northwestern portion breaks down into the rolling and glady limestone lands referred to, and constitutes the section of the county belonging to the western valley of the Tennessee river. Within it are a few long spurs from the highlands reaching out far toward the river. The northeastern portion crowds upon the valley of Buffalo river, the limit in that direction. Many of the creeks, before passing the boundaries of the county, become considerable streams, and cut deeply into the table-land down to underlying limestone rocks, thereby supplying long, narrow valleys of strong, arable lands.

Indian and Hardin's creeks, flowing westward and then northwestward through Hardin county into the Tennessee, have valleys especially deep. Many others are but little less so.

The rocks of the county are first, at top, siliceous or calcareo-siliceous beds, surmounted in some regions with cherty limestones, making the floor of the highlands; and, secondly, below these, grayish and reddish marly limestone, outcropping in the valleys and on the lowland slopes of the northeastern portion. As in other counties bordering on the Tennessee river, the marly limestones outcrop here and there, forming glades, bespotted with clumps of cedars. Upon any of the strata of the county, high or low, it is no unusual thing to meet with patches of gravel, outliers of the orange-sand drift.

The soils of the highlands are poor and thin, and miles may be traveled through the woods without meeting with a house or a hut. Oaks of moderate size prevail (white, black, chestnut, black-jack, post, and others), and with these are poplar, chestnut, and, in the southern part of the county especially, yellow pine. The timber on rolling lands is better than that of the flatwoods. The farming lands are substantially confined to the valleys, the lands of which are often rich, the soils mellow, and subsoils clayey and gravelly, producing corn, cotton, wheat, oats, rye, sorghum, peanuts, tobacco, and hay. The cotton product in 1869, according to census reports, was 1,101 bales of 400 pounds each, as against 1,207 bales of 475 pounds each in 1879. The map of relative acreage in cotton shows that the western and southern portions had in 1879 the greatest per cent. of area in cotton, namely, from 1 to 5 per cent., and the northwestern part the least, below one-tenth of 1 per cent., while an intermediate strip had from one-tenth to 1 per cent.

LAWRENCE.

Population: 10,383.—White, 9,599; colored, 784.
Area: 590 square miles.—Woodland, all.
Tilled lands: 47,855 acres.—Area planted in cotton, 1,830 acres; in corn, 21,673 acres; in wheat, 8,053 acres; in oats, 2,812 acres; in rye, 357 acres; in tobacco, 31 acres.
Cotton production: 702 bales; average cotton product per acre, 0.38 bale, 546 pounds seed-cotton, or 182 pounds cotton lint.

Lawrence is one of the southern tier of counties, and rests upon the Alabama line, and is the second county west of the longitude of Nashville. It is a typical area of the Highland Rim. The wooded flatlands and rolling

surfaces are often more than 1,000 feet above the sea, and from 300 to 400 feet above the floor of the Central Basin to the east. From a belt lying east and west, north of the center, some of the branches and creeks run northward to form Buffalo river, and others southward to form the most important stream of the county, Shoal creek. The latter flows diagonally through the larger portion of the county, escaping at the southwestern corner. Sugar and Blue Water are other creeks in the southeastern and southern portions. High table-lands prevail in the county, supporting a growth of black, red, white, post, chestnut, and black-jack oaks, chestnut, black gum, dogwood, and occasionally hickories and poplars. More favored areas, however, occur with a stronger soil and timber of a better class. The northern part is made rolling or hilly by the tributaries of Buffalo river, while the southern part is cut deeply into by the rapid creeks of that section, and the continuity of the table-lands is much broken by the valleys, often wide and fertile, of these streams. The formations of the highlands are those characteristic of the Highland Rim, calcareo-siliceous rocks, with which are limestones more or less cherty. The deepest valleys in the southern portion of the county are cut down through these, exposing the lower gray and blue limestones. The lands of the county have been classified as follows: Bottoms and second bottoms; rich hill lands near the creeks; less productive hill lands farther from the creeks; first quality of table-land, second quality of table-land, or the "barrens". The crops are given above. For most of the county the percentage of total area planted in cotton was in 1879 less than 0.1; in the southwestern and southeastern corners it was greatest, from 1 to 5.

ABSTRACT FROM REPORT.

N. M. HOLLIS (southwestern part of the county, waters of Shoal creek).—Neither soil nor climate is well suited to cotton. The soils cultivated in cotton are: (1) Second bottom; (2) third bottoms, southeastern and western hillsides; (3) hill-top. The *second bottom soil* is a gravelly dark loam, forming about one-tenth of our lands. It does not occur in great bodies, and is confined to creek valleys, which are separated by hills and table-lands. The growth is hickory, walnut, poplar, chestnut, ash, a variety of oaks, beech, persimmon, sugar-tree, gum, elm, and hackberry. The subsoil contains angular gravel, and is underlaid by gravel or rocks at 3 feet. The land is naturally well drained, and is best adapted to corn, vegetables, clover, and grasses. About one-tenth of the crops is cotton. Plants grow from 2 to 6 feet high, but are best at from 3 to 3½ feet. Late rains and too late cultivation incline the plants to run to weed. The use of fertilizers, early and good cultivation, and topping in August are the remedies. The seed-cotton product per acre on fresh land is from 800 to 1,000 pounds, 1,425 pounds making a 475-pound bale; staple good ordinary. After twenty years' cultivation the seed-cotton product per acre is from 500 to 600 pounds, and with manure 1,000 pounds, 1,485 pounds then making a bale; staple same as before. The weeds are cocklebur, crab-grass, and ground ivy. None or but little of the land lies turned out. Slopes do not wash seriously. Little is done to check the damage.

The *third bottom or hillside soil* exists in small proportion and over short distances. Growth, small kinds of oaks, poplar, chestnut, hickory, persimmon, and sassafras. The soil is a gravelly clay loam from 3 to 12 inches thick. The subsoil is more or less impervious, contains angular gravel, and is underlaid by gravel and rock at 3 feet. The land is easily tilled in dry weather, and one-tenth of the crops is cotton. Plants grow to 2½ and 3 feet. The seed-cotton product per acre on fresh land is from 600 to 700 pounds, 1,425 pounds making a 475-pound bale; staple good ordinary. After fifteen years' cultivation the product is from 300 to 500 pounds, and with manure from 600 to 700 pounds; staple about the same. Crab-grass is troublesome. One-tenth of the land lies turned out, and would produce well again if manured. The slopes in some instances wash seriously, but the valleys are little injured by it. Some little horizontalizing is done, with moderate results.

The *hill-top or highland soil* makes over half the lands, and extends widely in all directions. It is a gray or yellowish loam. The subsoil contains gray, angular gravel, with rock or gravel below. The land is early and warm, is naturally well drained, and is best adapted to wheat and corn. One-fifteenth of the crops is cotton. Plants grow from 2 to 2½ feet high. The seed-cotton product per acre on fresh land is from 300 to 400 pounds, 1,425 pounds making a 475-pound bale; staple good middling. After ten years' cultivation the product is from 200 to 400 pounds, or with manure from 400 to 500, 1,485 pounds then making a bale; staple about the same. The weeds are grass and rag-weed. One-fifth of the land lies turned out, and very of little such land is taken in again. Slopes wash seriously, but the valleys are not much injured. Little is done to check the damage.

LEWIS.

Population: 2,181.—White, 1,963; colored, 218.
Area: 360 square miles.—Woodland, all.
Tilled lands: 11,654 acres.—Area planted in cotton, 229 acres; in corn, 5,272 acres; in wheat, 1,139 acres; in oats, 339 acres; in tobacco, 7 acres.
Cotton production: 102 bales; average cotton product per acre, 0.45 bale, 636 pounds seed-cotton, or 212 pounds cotton lint.

Lewis county occupies a central position in that section of the Highland Rim which lies between the valley of Duck river and the Alabama line. It is one of the small counties of the state, is twice as long as it is wide, and lies lengthwise east and west between Hickman on the north and Wayne and Lawrence on the south. It is a high, wooded table-land with thin soils, bearing a growth of red and black oaks, chestnut, tough poplars, called "blue poplars", small hickories, and other similar growth. Long distances may be passed without the sight of a field or a human habitation, and such is the county in the main. The table-land, however, is traversed by the valleys of many creeks, in which the cultivated land lies and the people live. The population of the county is very small, and less than that of any other county in the state. There are but six inhabitants to the square mile, while Maury, lying next east, in the Central Basin, has nearly sixty-eight to the mile. The wildness of the uplands becomes apparent when it is considered that the scanty population is substantially confined to the valleys. Buffalo river lies to the south, in a portion of its course flowing westward through an angle of the county, and in another portion making a part of the southern boundary. This river, flowing to the west beyond the county for 5 miles or thereabout, turns squarely to the north and runs through Perry county, thus becoming parallel, though not contiguous, to the western boundary of Lewis. We may say that Lewis, with a small rectangular section of Perry, lies in the great angle of Buffalo river. The central highlands of the county embrace the headwaters of numerous creeks, flowing off severally in all directions. Swan creek, having the heads of its chief tributaries in the eastern and northern portions, flows northward and empties into Duck river in Hickman county. Cane creek rises in the northern portion, flows northwestward through a corner of Hickman, and unites with the Buffalo in Perry. Smaller creeks rise on the highlands of the western margin, and flow westward to the Buffalo in the same county. Trace, Big Rock House, and

Grinder's creeks, mostly with fertile valleys, rise in the central portions and flow southward into the Buffalo. In the small fraction on the south side of the Buffalo, cut off by the river, are lower parts of other creeks heading in Lawrence.

The rocks of the highlands consist of calcareo-siliceous beds, with here and there limestones, generally cherty. Below these lie gray limestones of an older age. Black and greenish shales often separate the two series. Resting upon these in the highlands or in the valleys one may occasionally meet with outlying patches of the orange-sand drift—gravel beds, in which at some points iron ore has accumulated in sufficient quantity to make an "ore bank" of value. The deepest portions of the creek valleys reach down to the gray limestones, and these supply a moderate proportion of the soils of the second bottoms or sloping lands. Much of the valley land, however, is based on the higher beds. The soils may be classified as follows: The alluvial of the bottoms, the gravelly soils of slopes and rolling lands, and the thin soils of the highlands. The first are very rich, and the second often mellow and productive. The chief crops are corn, wheat, peanuts, oats, and cotton, with some rye and barley. On the map of relative acreage in cotton the county is seen to have had in 1879 less than 0.1 per cent. of its total area in cotton.

PERRY.

(See "Western valley of the Tennessee river".)

HICKMAN.

Population: 12,095.—White, 9,849; colored, 2,246.

Area: 610 square miles.—Woodland, all.

Tilled lands: 71,970 acres.—Area planted in cotton, 3,128 acres; in corn, 30,716 acres; in wheat, 7,874 acres; in oats, 2,896 acres; in rye, 225 acres; in tobacco, 51 acres.

Cotton production: 1,302 bales; average cotton product per acre, 0.42 bale, 594 pounds seed-cotton, or 198 pounds cotton lint.

Hickman is the central county of the western subdivision of the Highland Rim. It is nearly square in form, and is set a little obliquely to the cardinal points, its eastern and western sides ranging east of north. The county, as a whole, is a table-land nearly 1,000 feet above the sea. It is, however, so seriously cut into by the valleys of rivers and a score of creeks that its characteristics as a table-land are not always recognizable. It is cut up rather symmetrically by the streams. The tortuous Duck river, flowing north of west through the county, cuts it into two nearly equal parts. Piney river, Lick creek, and other creeks, tributaries of the Duck river, with their sprays of smaller streams, divide the northern part into varied sections, wide plateau areas or flat-topped ridges, or, it may be, render the surface rolling and hilly, and Swan and Beaver Dam creeks, with their sprays of streams, do the same thing for the southern part. High flat lands abound in the extreme northern and southern portions of the county.

The strata of the highlands and ridges are calcareo-siliceous rocks and cherty limestones, yielding a thin, poorly remunerative soil, with a growth characterized by red, black, chestnut, post, and black-jack oaks, with hickories, chestnut, and some poplars. Much of the county is of this character, and long stretches of country occur without inhabitants; yet there are large exceptional areas with rolling surface, in which the lands are much better, the timber heavier and of a better class, and the soils, especially along the streams, under cultivation.

The deep valleys, cut down from 300 to 500 feet below the general level of the highlands, expose the strata underlying the rocks of the latter, chiefly gray and blue limestones. These limestones, with the alluvial bottoms, supply the best and the main producing lands of Hickman. They have their greatest outcrop in the eastern part of the county, where the Duck River valley and the creek valleys, such as those of Swan and Lick creeks, are the widest. (*a*) In the western part of the county their outcrop (owing to a local dip of strata to the west) is confined to the lowland levels of the Duck river. Rich alluvial and fair sloping lands, however, occur at intervals along the whole length of the river to the western boundary. Piney valley is chiefly (due to the westerly dip) in the siliceo-calcareous and cherty limestone strata noticed as pertaining to the highlands, and does not cut down to the gray and blue limestones until within a few miles of the Duck river. It is, however, often wide, with many rich and desirable farming sections, embracing bottoms and sloping lands. Its soils are generally very gravelly, made so by angular, cherty gravel from the hills, which indeed is true of most of the soils of the county, though the limestone soils of the more open valleys are less so than others. The creek valleys, generally of the western portion of the county, are based on the same siliceous strata of the highlands, their lands being poor and thinly settled. The valleys of the southwestern portion, however, must be excepted. Here the strata are more elevated and the beds of the larger creeks, as that of Cane creek, in gray limestones, their valley areas often wide, well settled, and productive. The timber of the better valleys is poplar, beech, maple, ash, box-elder, white oak, walnut, butternut, red-bud, elm, ironwood, etc.

The crops of the county include, in addition to those given at the head of the description, peanuts, one of the chief crops, barley, buckwheat, cow-pease, sorghum, clover, and grasses. In 1869 the cotton product was 755 bales (400 pounds each), equal to about 636 475-pound bales of cotton, as against 1,302 bales (475 pounds each) in 1879, a marked increase. On the map of relative acreage planted in cotton in 1879 it is seen that in a central belt, lying on both sides of the Duck river, and widening toward the east, the percentage was the greatest, from 1 to 5; in belts outside of this, one on each side, from 0.1 to 1; while in the extreme northern and southern portions it was the least, less than 0.1.

a The Duck River valley is here indeed the beginning of the great Central Basin to the east, to which the blue limestone especially pertains.

ABSTRACT FROM REPORT.

J. M. GRAHAM (lands of Piney and Duck rivers.—For kinds of soils, etc., see page 27).—On the first soil, bench or second bottom land, cotton grows from 3 to 5 feet, 3 feet being the best. Wet seasons, in July or August, incline the plant to run to weed, for which topping is the remedy. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,735 pounds making a bale of 475 pounds; staple middling. On land tilled ten years the product is 800 pounds per acre. The troublesome weeds are in the order named: Morning-glory, smart-weed, cocklebur, careless-weed, and lamb's-quarter; also crab-grass, rag-weed, and purslane. None of the land lies turned out. The slopes wash seriously, the valleys being injured thereby but little.

On the fresh hillside or uplands cotton grows to 18 inches. Seed-cotton product per acre on fresh land is from 750 to 800 pounds, 1,735 pounds making a 475-pound bale. On land tilled ten years the product is from 500 to 600 pounds. The weeds are crab-grass, rag-weed, and careless-weed. One-twentieth of the land lies turned out. Such land taken in again is generally much improved, depending upon the time it has been idle. The slopes wash seriously, the valleys being injured but little. Nothing is done to check damage.

On the land on the ridges cotton grows 10 and 18 inches high. The seed-cotton product per acre on fresh land is from 600 to 700 pounds, 1,735 pounds making a 475-pound bale; staple middling. On land tilled ten years the product is from 300 to 600 pounds. The weeds are crab-grass, foxtail, rag-weed, and purslane. One-twentieth of the land lies turned out, and if let alone for ten or fifteen years it is much improved. The slopes wash seriously, but the valleys are little injured. Cotton is shipped by wagon to Nashville or to Pinewood, where the Nashville price is paid for it.

HUMPHREYS.
(See "Western valley of the Tennessee river".)

GILES.
(See "Central Basin".)

MAURY.
(See "Central Basin".)

WILLIAMSON.
(See "Central Basin".)

SUMNER.
(See "Central Basin".)

DAVIDSON.
(See "Central Basin".)

Giles, Maury, Williamson, and Davidson counties have western portions, and Sumner a northern portion on the western subdivision of the Highland Rim, within the limits of which some cotton was raised. From the rim lands of Sumner, however, two bales only were reported.

HIGHLAND RIM (EASTERN SUBDIVISION).

This subdivision embraces the greater parts of the counties of Franklin, Coffee, Warren, White, De Kalb, Putnam, Overton, Clay, and Macon, considerable parts of Jackson, Cannon,* Moore,* and Lincoln,* and small parts of Bedford,* Grundy, Van Buren, and Smith.*

This entire subdivision must be referred to the "penumbral region" of cotton culture. As a cotton-producing district, however, it makes a better showing outside of the cotton belt proper than any other of equal extent in Tennessee. The counties embraced, with the cotton produced in 1879 and arranged in the order of greatest production, are as follows: Franklin, 171 bales; White, 139; Warren, 96; Overton, 41; Jackson, 28; Coffee, 20; De Kalb, 12; Putnam, 4; Macon, 1; and Clay 1. With these must be included the northwestern part of Van Buren and the southwestern part of Grundy counties, chiefly pertaining to the Cumberland table-land, but having the parts given resting upon the lower Highland Rim, where, substantially, all the cotton reported from the counties, 29 bales from Van Buren and 21 from Grundy, was raised.

On the map of relative acreage in cotton the cotton areas of the eastern subdivision (usually with less than one acre in a hundred in cotton) are well seen. With inconsiderable exceptions, all are upon the Highland Rim and in parts of counties lying along the western foot of the Cumberland table-land. (*a*) The largest area is in White, Van Buren, and Warren, the next in importance in Grundy and Franklin, and a third in Overton. The chief soil of the areas is the calcareous red clay of the Saint Louis limestone, brown when fresh, becoming red by cultivation, the soil mixing with the underlying red clay subsoils. (See Part I, under the Highland Rim.)

One county only of the subdivision is described. This may be taken as a type of the counties in the tier that includes the chief cotton areas, the tier extending in a direction east of north through the state, with its western part on the Highland Rim and its eastern on the more elevated table-land. For description of the area of non-cotton producing counties, see general regional descriptions.

a The small areas in Jackson, Putman, and De Kalb are the exceptional ones. They are chiefly on the rim, miles away from the table-land, but in some parts (in Jackson especially) extend down into valleys referable to the Central Basin.

FRANKLIN.

Population: 17,178.—White, 13,646; colored, 3,532.

Area: 590 square miles.—Woodland, all.

Tilled lands: 92,753 acres.—Area planted in cotton, 414 acres; in corn, 41,560 acres; in wheat, 20,178 acres; in oats, 5,959 acres; in rye, 204 acres; in tobacco, 61 acres.

Cotton production: 171 bales; average cotton product per acre, 0.41 bale, 588 pounds seed-cotton, or 196 pounds cotton lint.

Franklin is the most southeasterly county of the Highland Rim. Its form is polygonal, approaching that of a semi-ellipse, with the base resting upon the Alabama line, and having a position east of the longitude of Nashville. The county is divided into two nearly equal parts: the northwestern, on the Highland Rim, with an average elevation not much if any less than 1,000 feet above the sea, and the eastern and southeastern, on the Cumberland table-land, 1,000 feet higher, or 2,000 feet above the sea. Neither part is unbroken. The Highland Rim west of the county-seat (Winchester) has the immediate valley of Elk river, 300 or 400 feet deep, eroded out of it, the latter supplying an area of rich blue limestone slopes and river lands like those of the great Central Basin. The area is indeed an inlet of the basin reaching eastward into the highlands. The table-land, on the other hand, is deeply cut in two in its eastern part by the narrow valley of Crow creek, a stream heading in the mountains and running southward to the Tennessee river. It is further cut along its Alabama margin by creeks rising within its limits and running into that state. There are also great openings within the area of the table-land, "inland coves" we may call them, such as Lost cove, Sinking cove, Round cove, and others.

The Highland Rim portion, making the great body of land in cultivation, includes a wide belt of strong red clayey lands, both level and undulating, extending northeastward and southwestward through the county parallel to the general direction of the Cumberland table-land. The belt spreads out laterally toward the table-land, and embraces the rich coves at its foot. Like the belt, too, in soils and rocks, are the valley of Crow creek and the lower parts of the "inland" coves of the mountain. On the northwest the belt gives place to the "barrens", with gray and thinner soils and a growth chiefly of half-size black and red oaks. The soil of the red lands, when fresh, is brown, with a red clay subsoil. The plow, however, after a few years' cultivation, mixes the two, and the red prevails. The underlying rocks are cherty limestones (Saint Louis), the liberated chert rendering the subsoils and soils gravelly with angular flinty or siliceous *débris*. Many streams traverse this portion of the county, their valleys contributing rich bottoms and arable slopes. Elk river flows for many miles over its rocks in the northern part of the county before descending into the "inlet" spoken of.

The lands of the table-land or mountain are based on sandstones and shales. They are thin and sandy, with an open growth of oaks, and have, with one noted and honorable exception, a scanty population, or none at all. The exception is that portion in the northeastern part of the county upon which the University of the South and its surroundings are located. The western, or rather northwestern, edge of the table-land is greatly indented with escalops and notches, and sheltered in these are the coves, some of large size, lying at its foot, the rich lands of the latter being greatly in contrast with the barren-like lands of the mountain. The edge of the mountain commands a most extensive view to the northwest. At the foot are the coves; beyond these, spreading out almost indefinitely, are the great plains of the Highland Rim, and in the dim distance, hardly discernible, the breaks marking the beginnings of the lowlands of the Central Basin. (For a notice of the steep slopes of the mountain, see page 35, under "The Cumberland table land".)

The native growth of the red lands, especially near creeks, and that of the coves and of the slopes of the table-land, includes many species, white and other oaks, poplar, black and white walnut, hickory, elm, linden, beech, ash, locust, etc. The timber is heaviest near the foot and on the slopes of the mountain. Away from the mountain and out of the valleys the growth is less heavy, black and red oaks abounding, with hickory and dogwood. Reaching the "barrens", black-jack, with its usual associates, appears. The chief crops are given above. Additional products are barley, buckwheat, potatoes, pease, and sorghum. Franklin in 1869 produced 289 bales of cotton (400 pounds each), and in 1879, 171 bales (475 pounds each), a falling off equal to 72 standard bales of 475 pounds each. The areas of the county in which the staple is cultivated, and also the relative acreage planted in each, may be seen on the map.

ABSTRACT FROM REPORT.

JOHN F. ANDERSON (southeastern corner of the county, Crow Creek valley.—For a notice of valley, kinds of soils, etc., see page 27). On the first soil, the alluvial, cotton plants grow from 3 to 6 feet in height, and are most productive at 4 feet. They incline to run to weed where left too thick and are not properly worked. The remedy is to top in August. The seed-cotton product per acre on fresh land is 1,500 pounds, 1,780 pounds making a 475-pound bale; staple good ordinary. After ten years' cultivation the product is 800 pounds, 1,545 pounds making a bale; staple low middling. The weeds are rag-weed, cocklebur, lamb's-quarter, and a little crab-grass. One-tenth of the land lies turned out, and if taken in again would produce as well as at first.

Of the yellowish and calcareous soil about one-fourth is planted in cotton. Plants grow to 3 and 4 feet, 3 feet being the best. The seed-cotton product per acre on fresh land is from 1,000 to 1,200 pounds, 1,660 pounds making a 475-pound bale; staple good ordinary. After eight years' cultivation the product is from 600 to 700 pounds per acre, 1,545 pounds making a bale; staple much better; the older the land the better the cotton. The weeds are Spanish needles, cocklebur, smart-weed, and dog-fennel. Very little of the land lies turned out, and produces about as well after a rest of a year or two. Very little washing occurs on slopes. No cotton is raised on the soil of the rocky mountain side.

Cotton is shipped to Nashville at $1 40 per bale, or to Cincinnati.

CANNON.

(See "Central Basin".)

MOORE.

(See "Central Basin".)

LINCOLN.

(See "Central Basin".)

BEDFORD.

(See "Central Basin".)

SMITH.

(See "Central Basin".)

THE CENTRAL BASIN.

This embraces the whole or parts of the following counties: The greater part or all of Giles, Lincoln, Moore, Bedford, Marshall, Maury, Williamson, Rutherford, Davidson, Wilson, Sumner, Trousdale, and Smith; large parts of Cheatham,* Jackson,* and Cannon; and small parts of Macon,* Putnam,* De Kalb,* and Coffee.* The counties of the basin wholly within the cotton region proper are: Giles, Lincoln, Bedford, Marshall, Maury, Williamson, Rutherford, Davidson, Wilson, and Sumner. These are described below. Of the remaining counties, as named in Tables I and II, Moore reported, as the product of 1879, 7 bales; Cannon, 35; Smith, 0; and Trousdale, 1 (see also note at foot of page 11). The location of the cotton-producing section of the basin, with its areas of greatest and least production, may be seen to advantage on the map of relative acreage in cotton. This map may be compared with the diagram of the state on page 11. Lawrence and Lewis are entirely west of the basin. Much the greater part of Hickman is also, but the portion of the valley of Duck river in the eastern part of this county is properly referred, through its topography, rocks, and soils, to the basin. It is an inlet of the latter, reaching westward into the highlands. Not much, if any, less than two-thirds of the cotton product of Hickman must be accredited to the basin.

The Central Basin supplies, as stated on page 19, a subordinate center of cotton culture. In 1879 it produced 50,000 bales in round numbers, equal approximately to 15 per cent. of the entire yield of the state. The increased yield of the basin over that reported in the census of 1870 is, allowing for difference in weight of bales, 47 per cent.

GILES.

Population: 36,014.—White, 21,824; colored, 14,190.

Area: 590 square miles.—Woodland, all.

Tilled lands: 170,599 acres.—Area planted in cotton, 31,416 acres; in corn, 67,758 acres; in wheat, 30,795 acres; in oats, 2,592 acres; in rye, 1,124 acres; in tobacco, 66 acres.

Cotton production: 13,802 bales; average cotton product per acre, 0.44 bale, 627 pounds seed-cotton, or 209 pounds cotton lint.

Giles takes the lead of the counties of the basin in cotton production. This county was originally nearly a rectangle in form, with its longer dimension extending north and south. In 1870 its northeastern corner was cut off to Marshall. It is one of the southern tier of counties, and rests upon the Alabama line in a position immediately west of the meridian of Nashville. Elk river and its tributary, Richland creek, are the chief streams. The first crosses the southeastern corner of the county, and the second, the most important, traverses much of the interior. Both have wide valleys with exceedingly fertile bottoms and slopes. Besides, there are numerous tributary creeks, all with bodies of choice lands. The county is made up of rich valleys and bold, though usually narrow ridges. The prominent ridges rise to the level of the Highland Rim surrounding the basin, and are capped off with its characteristic rocks. We may suppose indeed the flat highlands to have extended once unbroken over the whole area of the county, and that the waters, assisted by atmospheric agencies, have since scooped and worn out the valleys, leaving remnants of the highlands to stand as ridges.

With the exception of the western margin of the county, which rests mostly upon the Highland Rim, the area of Giles county is within the basin. It is one of the group of counties lying south of Elk ridge and spoken of on page 28, to which the reader is referred. The lands of the valleys and their slopes, excepting alluvial bottoms, are based on Silurian limestones, and mainly upon the Nashville series. (See page 30.) In some parts of the valley of Richland creek and its tributary, Big creek, the lowlands rest in places upon rocks of the Orthis bed, and even upon the Carter's Creek limestones. The limestone lands are everywhere naturally strong clay loams, mellow, often tempered with small cherty gravel, very fertile, and are found on second bottoms, moderate slopes, and steep declivities of the ridges. The lands of the ridge tops rest on siliceous or flinty and calcareo-siliceous rocks. Their soils are charged with flinty *débris*, and are but moderately fertile. A part of the gravel of the lower limestone lands comes from the ridge tops, though much is from the chert and siliceous fossils of the limestone in place. As to native growth, reference must be made to the abstracts of correspondents. The map of relative acreage in cotton will exhibit the belts of greatest and least production. On this the immediate valleys of Elk river and Richland creek hold the first place as cotton-producing areas. Cotton is shipped to Nashville by rail at $1 75 per bale, or is sold at home.

ABSTRACTS FROM REPORTS.

D. T. REYNOLDS AND T. O. ABERNATHY (northern part of the county, waters of Richland creek).—The soils cultivated in cotton are: (1) Dark and brown loam of bottoms, with dark clay subsoils; (2) lighter loam, with reddish clay subsoils (uplands below flint lands); (3) gravelly or flint upland (near tops of ridges). The first, the loam of the second bottoms, is the chief soil, which forms about one-fourth of the lands, and occurs in a belt varying from 2 to 4 miles wide on either side of Richland creek, with a length of 30 miles. The chief timber is beech, elm, sugar-tree, black walnut, ash, and poplar. The soil is 10 inches thick, of a mahogany color, and rests upon a hard-pan or red clay and gravel mixed, all underlaid by rock at from 2 to 10 feet. The land is easily tilled in wet or dry seasons if not too wet in spring for preparation, and is best adapted to corn and cotton, the latter forming one-half of the crops. Cool weather in July inclines the plant to run to weed, the remedy for which is early and deep preparation and shallow cultivation. The seed-cotton product per acre on fresh land is from 1,200 to 1,750 pounds, 1,545 pounds (allowing 25 pounds for bagging and ties) making a 475-pound bale; staple rates as middling. On land cultivated for thirty years from 1,200 to 1,600 pounds of seed-cotton per acre were produced in 1879 on many farms, 100 pounds making from 29 to 31 pounds of lint; staple from one to two grades better than that from fresh land if the autumn was dry. The weeds are crab-grass and careless-weed. No land lies turned out. Slopes wash seriously if not well managed, the valleys being benefited thereby unless too much clay is washed down. Hillside ditching and level culture are done with good success.

The *upland soil* below the flint lands makes one-half of the lands. The growth is beech, poplar, oak, elm, and hickory. The soil, a clay mahogany loam, is from 4 to 10 inches thick. The subsoil, a tough reddish-yellow clay, is usually free from gravel, and is underlaid by limestone and sandy rock at from 4 to 6 feet. The land is easily tilled in wet and dry seasons, is early, warm, and well drained, and is best adapted to cotton, corn, and pease.

The *flint upland soil* makes about one-fourth of the lands, and is found on all the hills of the county. The growth is oak, hickory, elm, and walnut. The soil is a brown clay and gravel mixed, and is from 3 to 10 inches thick. The subsoil contains gravel, and is underlaid by limestone at from 4 to 10 feet. Land is easily tilled in all seasons, is early and warm, and is best adapted to corn, wheat, oats, and rye.

J. E. ABERNATHY AND SAMUEL YOKLEY (northwestern part of the county, waters of Big creek.—For kinds of soils, etc., see page 35).—On the second bottom mulatto soil cotton grows to 3 feet, and is best at that. The plant inclines to grow to weed on fresh soil after clover and after excessive rain in August. The remedies are cultivating thick in the drill, shallow plowing, and sometimes topping. The seed-cotton product per acre on fresh land is from 800 to 1,200 pounds, 1,545 pounds making a 475-pound bale, the staple rating low middling. On land cultivated ten years, rotating with corn and wheat, the product is from 600 to 800 pounds per acre, 1,660 pounds being needed for a bale, the staple being shorter. Weeds on fresh land are cocklebur and Spanish needles; afterward, careless-weed and lamb's-quarter. On the creek very little land lies turned out. Slopes wash only on badly managed farms. Horizontalizing and hillside ditching are done, with good success.

On the gravelly hillside soil cotton grows to 3 feet, and is best at that. Seed-cotton product per acre on fresh land is from 800 to 1,000 pounds. This land deteriorates by constant cultivation in cotton.

On the ridge land soil cotton grows to 2 feet. Seed-cotton product per acre on fresh land is 800 pounds, 1,545 pounds making a 475-pound bale. The staple is the best produced on our soils. The land does not bear continued cultivation in cotton.

JIM RIVERS AND NEWTON WHITE (waters of Richland creek).—There are some very coarse sandy lands on the high banks of Richland creek from 2 to 5 miles from its junction with Elk river. Such lands are not often seen in Tennessee. The lowlands are not as reliable as the uplands, but when the season suits they make more lint, but of poorer quality. Hillsides exposed to the south are always best for cultivation, opening, and quality of lint, but require manure and rest. The soils cultivated in cotton are: (1) Coarse sandy, surest for a crop, and makes the best staple; (2) poplar soil, mulatto or brown, with yellowish-red subsoil; (3) bottom or black soil.

The *coarse sandy soil* forms a fourth or less of our lands, and extends from 1 mile north to 3 miles south in patches along the creek and river. The growth is poplar, beech, and hickory. Cotton forms two-thirds of the crops. The seed-cotton product per acre on fresh land is 1,000 pounds.

The *poplar or mulatto soil* comprises one-half the cotton lands, and is found generally over the county from the Alabama line northward in tracts of from 1,000 to 10,000 acres, nearly all of which is planted in cotton. The growth is poplar, beech, ash, some hickory, and elm. The seed-cotton product per acre on fresh land is from 700 to 1,200 pounds.

The *bottom or black soil* makes one-third of the lands planted in cotton, and is found all over the county in creek bottoms. The growth is sweet gum, beech, and elm. Cotton forms about one-half the crops. The seed-cotton product per acre on fresh land is from 200 to 1,500 pounds.

J. N. PATTESON AND W. RIVERS (waters of Richland creek and Elk river).—The uplands contain flinty gravel, are fertile, easily cultivated, endure drought, suffer less from wet weather, and are the most reliable farming lands in the county. The kinds of soils cultivated in cotton are: (1) Brown and mahogany clay loam or yellow poplar soil; (2) black soil on most of the small creeks of the county. The *brown and mahogany clay loam* forms three-fourths of the lands, and occurs throughout the eastern, over three-fourths of the southern, half of the northern, and one-third of the western portions of the county. The growth is black walnut, beech, yellow poplar, sugar-tree, hickory, linden, buckeye, and oaks. The subsoil is a tough clay that will hold moisture and retain manure. The land is well adapted to cotton, corn, wheat, potatoes, rye, sorghum, grasses, etc. About one-fourth of the land is planted in cotton. The seed-cotton product per acre on fresh land is from 1,000 to 1,600 pounds; on good land cultivated for twenty years with alternation of crops, from 800 to 1,200 pounds.

The *black soil* forms one-fourth of the lands. The growth is sweet gum, oak, box-elder, maple, etc. The land is best adapted to corn. About one-half of the crops is cotton. Seed-cotton product per acre on fresh land is from 1,200 to 1,600 pounds; after twenty years' cultivation, from 800 to 1,200 pounds.

J. J. LINDSAY (waters of Egnew's creek, west of Pulaski).—Our hill soils produce cotton about as well as the lowlands, stand long droughts better, and, owing to the gravel present, never bake. The soils cultivated in cotton are: (1) Brown, with very little gravel, or beech and poplar land, making about one-half the lands that occur along Egnew's and Richland creeks, about one-half of which is planted in cotton; (2) hill-land soil, dark, with flinty gravel, making nearly half the lands, about one-third of which is planted in cotton; and (3) clay ridge soil, worthless except for chestnut timber.

J. S. EDMONSON, J. F. PARKER, AND J. G. MASON (Civil District No. 2, Jenkins', Ford's, and Richland creeks, southwestern part of county).—The soils do not vary much from hill to hill, all being well adapted to cotton-growing. The growing season is too short to risk the first bottoms. The soils are: (1) Hill or upland on brooks or on the river, making 60 per cent. of the lands; (2) mahogany second bottom; (3) first bottom. The first is found 10 miles off in every direction. It rests upon a clayey subsoil, running down into coarse gravel and flinty masses, with limestone at from 3 to 15 feet.

J. K. P. BLACKBURN (lands of Richland and Bradshaw creeks, eastern part of the county).—The uplands vary from rather elevated undulating table-lands to steep slopes and rugged hills. The soils cultivated in cotton are: (1) Brown or mahogany lands, lying well, with undulating surface, known to us as sand-rock land, which constitutes one-half of the lands, and occurs from 12 to 15 miles north, west, and south, and 6 miles east of this locality; is a quick, lively soil, from 3 to 12 inches thick, and has a subsoil of stiff, yellowish or reddish clay, getting harder on long cultivation, and underlaid by limestone at from 1 foot to 10 feet, with one-third to one-half planted in cotton; (2) second bottom soil, occurring along Richland creek for 25 miles; (3) steep hillside and ridge top, from one-third to one-half of the lands. (Further details much as in other reports.)

T. B. WADE (lands of Pigeon Roost and Richland creeks, north of Pulaski).—Upland soils generally mixed with sharp, angular, flinty gravel. Some soils are free from gravel. Cotton is cultivated on southern hillsides, but will not mature on northern hillsides. On the black creek bottoms cotton is subject to rust, and the young fruit falls off. When the black soil is covered by a heavy deposit from a recent overflow of creek or river cotton grows well, and land subject to occasional overflow is the best for constant cultivation. The soils are: (1) Mahogany upland on southern slopes and in coves or valleys between the hills, making two-thirds of the lands, or the greater portion of uplands in the county, with nearly all that is suitable planted in cotton; (2) bottom soil above overflow, though bottoms with occasional overflows, as stated above, are better; (3) bottom with light deposit, the cotton on which is subject to rust. The general growth is beech and poplar on the hills and slopes, sugar-tree, elm, and some oak in the coves, and wild cherry, beech, walnut, and oaks in the bottoms. (Further details much the same as in reports.)

LINCOLN.

Population: 26,960.—White, 20,643; colored, 6,317.
Area: 540 square miles.—Woodland, all.
Tilled lands: 146,326 acres.—Area planted in cotton, 8,868 acres; in corn, 57,460 acres; in wheat, 37,279 acres; in oats, 2,993 acres; in rye, 268 acres; in tobacco, 39 acres.
Cotton production: 3,486 bales; average cotton product per acre, 0.39 bale, 561 pounds seed-cotton, or 187 pounds cotton lint.

The area of Lincoln was once nearly square. The establishment in later years of two counties, Marshall and Moore, deprived it respectively of its northwestern and northeastern corners, so that its northern boundary is now approximately circular or rounded. The county has a wide base resting on the Alabama line. The meridian of Nashville cuts off a slice of the western portion, throwing the body of the county to the east of this line. A controlling topographical feature is the immediate valley of Elk river. This stream runs nearly west through the middle of the county, its valley dividing the latter into two portions nearly equal in area, but very unequal in population and agricultural importance. To the south lie elevated flatwoods "barrens", pertaining to the Highland Rim. North of the valley the whole country is made up of a multitude of long and rich creek valleys, with intervening ridges. In many parts of the county, especially northward, the ridges are numerous and bold, rising to the height of the Highland Rim, and showing its siliceous strata as capping rocks. Approaching the Elk river from the north, the ridges tend to run out, and the valleys widen, often unite, and finally open into the greater valley of the river. The ridges are spurs of Elk ridge, which for a short distance is a part of the northern boundary of the county, and make a portion of the sprays of ridges spoken of on page 28, under the Central Basin.

The lands of Lincoln of most interest are the alluvial bottoms of the river and creeks, the lands of second bottoms, moderate slopes, and steep ridge sides, all of which are based on the blue limestones of the Nashville series, and are remarkable for their fertility. (See part of report just cited.) These make up much the greater part of the northern portion of the county. The ridges have a gravelly, thinner soil, but a better one than that of the unbroken "barrens" south of the Elk River valley. Their growth includes great "poplars", chestnuts, oaks, and elms. The high "barrens" to the south have great extent. The soils are thin and the growth half-size oaks. Approaching the Alabama line, the lands improve, and areas of brown lands, with red subsoils, resting upon Saint Louis limestones, are met with. Creeks also occur with valley lands of better quality.

The distribution of the percentage belts of cotton culture and their relation to the Elk River valley are exhibited upon the map of relative acreage in cotton. This county lies at the eastern limit of the cotton-growing region proper.

ABSTRACTS FROM REPORTS.

M. D. HAMPTON AND J. D. TILLMAN (lands of the Elk river).—The uplands are gravelly, with a dark yellow soil. Springs are sometimes too late, and frosts too early. The Elk River lands constitute two-thirds of all the lands cultivated in cotton. Their growth is oak, hickory, beech, poplar, gum, ash, etc. The soils are fine, sandy, and sometimes gravelly loam and heavy clay loam of gray, yellow, and blackish colors; the subsoil a reddish-yellow clay, mixed below with whitish gravel and pebbles, which becomes like the surface soil by cultivation, and is impervious when unbroken. Limestone rock occurs at from 10 to 30 feet. The land is easily tilled. The crops comprise all the grains and grasses, and some cotton. About one-half of the crops is cotton. Plants grow about waist-high in good seasons, but not so high in dry. The seed-cotton product per acre on fresh land is from 600 to 1,200 pounds, 1,660 pounds making a 475-pound bale; staple rates as middling. After a number of years' cultivation the product is from 400 to 800 pounds, 1,660 pounds making a bale, and the staple differing little. Crab-grass is troublesome. Very little land lies turned out and recuperates rapidly. Slopes do not wash seriously. Hillside ditching has been done with good success.

Cotton is shipped by rail to Nashville at $2 per bale.

BEDFORD.

Population: 26,025.—White, 18,536; colored, 7,489.
Area: 520 square miles.—Woodland, all.
Tilled lands: 164,800 acres.—Area planted in cotton, 2,239 acres; in corn, 68,492 acres; in wheat, 39,589 acres; in oats, 6,270 acres; in rye, 806 acres; in tobacco, 51 acres.
Cotton production: 940 bales; average cotton product per acre, 0.42 bale, 597 pounds seed-cotton, or 199 pounds cotton lint.

Bedford, nearly square in form, lies immediately south of Rutherford, the central county of Middle Tennessee, and is walled in on the east and south by the steep slopes of the Highland Rim and Elk ridge. Spurs from these

highlands encroach upon its area, but to no great extent, before breaking away into rolling lands or lines of hills between the streams. Hence the eastern and extreme southern portions of the county are undulating or hilly. They include, however, many beautiful and productive valleys and level areas.

West, northwest, and north from Shelbyville the surface is far less rolling, level or flat lands, indeed, predominating. This is the great cedar section of the county, and patches and belts of cedar glades are scattered all over it. It is, too, especially the more northwesterly part, the cotton section of the county. Cotton-growing lands, sometimes occurring in large bodies, alternate with cedar glades. Tracts are met with completely encircled by belts of these glades. The soil chiefly producing cotton is identical with the warm red soil of the cotton region of Rutherford county and rests upon the "central limestones", the lowest rocks geologically appearing at the surface within the basin. Above these, and resting upon them, often in low ridges, come the flaggy limestones of the cedar glades. These different limestones, with their soils and the character of the cedar glades, have been discussed on page 29 under the Central Basin.

All the Silurian limestones enumerated in the part of the report just referred to occur in Bedford, each supplying its characteristic lands and its characteristic topography. Leaving the checkered cedar and cotton section as a lower area, and proceeding backward either toward the eastern or southern boundaries of the county, we cross the successive belts of the outcropping limestones, ascending in the mean time until we land above the latter on the elevated and flinty lands of the Highland Rim or Elk ridge. The ascent is long, gradual, and irregular until the foot of the highlands is reached, when it becomes rapid. The whole, could we look from an elevated point in the northern section, would be a sort of grand topographical and agricultural amphitheater, but an exceedingly broken and interrupted one. These lands, though often very productive, are not cultivated in cotton to any noteworthy extent.

On the map of relative acreage in cotton it is seen that the northwestern corner only of Bedford lies within the cotton-producing region.

ABSTRACTS FROM REPORTS.

B. F. RANSOM, W. R. RANSOM, REV. M. F. THOMPSON, R. C. ALLISON, AND B. F. JARRELL (northwestern part of the county).—The chief soil is the dark red of the more elevated level land, making from one-half to two-thirds of the lands. The growth is black oak, dogwood, ash, walnut, hickory, and elm. The land is underlaid by limestone at from 2 to 6 feet, easily tilled in dry seasons, but is difficult when wet; it is early, warm, and well drained, and is well adapted to corn, wheat, oats, and clover. Not more than one-sixth of the crops is cotton. Plants grow to 4 feet, and are best at this height. They incline to run to weed when cultivated too loose in or near the drill, which can be remedied by running the mold-board of the Carey plow near the cotton. The seed-cotton product per acre on fresh land is from 700 to 1,000 pounds, about 1,660 pounds making a 475-pound bale; the staple rating well. After five years' cultivation the product is from 600 to 800 pounds per acre; staple not so good. The weeds are foxtail and crab-grass. Not more than 5 per cent. of the land lies turned out; but such land, if bushes are kept down and washes prevented, would produce well again. The soil washes on slopes; damage, 2 per cent. of value; valleys are not injured.

The *dark creek loam* makes about one-sixth of the lands in this section, and is best adapted to corn, wheat, and oats. Not more than 3 per cent. is planted in cotton in this section. The seed-cotton product per acre on fresh land is 800 pounds, 1,545 pounds making a bale. After twenty years' cultivation, if well managed, the product is as much as when fresh.

The *red gravelly clay* soil makes a tenth of the lands, and occurs in spots all over the region. The growth is poplar, ash, oak, etc. Very little land is planted in cotton. The seed-cotton product per acre is 400 to 500 pounds.

Cotton is shipped by rail and wagon to Nashville at from $1 to $2 per bale.

MARSHALL.

Population: 19,259.—White, 14,429; colored, 4,830.

Area: 350 square miles.—Woodland, all.

Tilled lands: 117,005 acres.—Area planted in cotton, 4,697 acres; in corn, 47,927 acres; in wheat, 30,484 acres; in oats, 4,675 acres; in rye, 392 acres; in tobacco, 47 acres.

Cotton production: 1,721 bales; average cotton product per acre, 0.37 bale, 522 pounds seed-cotton, or 174 pounds cotton lint.

Marshall is a hatchet-shaped county, with its broad edge turned southward and resting upon Giles and Lincoln. The meridian of Nashville passes lengthwise through the county, nearly bisecting its area. North of a line running east and west through Lewisburg, the county-seat, the county is level or moderately rolling. This part is a great checkered area, made so by alternating bodies of red cotton- and corn-producing land and cedar glades. The red lands (brown when fresh) are based on the "central limestones", and the glades, sometimes called significantly "cedar roughs," on the flaggy rocks of the "glade limestone". (See page 29, under the Central Basin.) It may aid in the understanding of this part of Marshall to assume the limestones of the red lands to be the floor or basis of the whole region, and that there have been squatted upon these at intervals belts and areas of cedar glades, from one mile to many square miles in extent, with their flaggy rocks and cedar timber. In harmony with this assumption, the belts and areas are often raised in low ridges and tables above the level of the red lands, like low islands above the sea. The aggregate areas of the red and cedar lands respectively are about equal. Chapel Hill is in a great body of the red lands noted for its beautifully lying and fertile farming tracts, and reaching from the northern boundary of the county across the Duck river to Farmington. The Spring Creek lands in the northeastern portion of the county are a part of this belt. Caney Spring and Verona are in another range. The greatest body of cedar land is in the northwestern corner of the county.

The southern portion of Marshall differs wholly from that north of Lewisburg. It is a great water-shed having Elk ridge, a backbone to the region, extending in an eastern and western course through its widest and middle part. The ridge is a bold summit which divides the waters of Duck river on the north from the waters of Richland creek on the south. It has numerous spurs. These are short on the north side, soon breaking up into foot-hills and productive rolling lands, with intervening fertile coves and valleys or broad level tracts. On the southern side the spurs are much longer, extending, where not cut off by coalescing valleys, far to the south. The valleys between them are mostly of unsurpassed fertility, and here and there open out into areas of the very best farming lands.

The soils of the valleys and slopes in the vicinity of Elk ridge, on both sides, are based on blue limestones of the Nashville series. They are brown and mulatto-colored, more or less gravelly, with heavy and varied native growth, warm, mellow, easily tilled, and suited to many crops. On the south side we have the head of the valley of Richland creek, so famous in Giles county as a productive area. Passing to the other side of the ridge, and proceeding northward toward the region of the cedar glades, belts of lands are successively crossed based on the sandy limestones of the Orthis bed and the pure lighter-colored ones of the Carter's creek group. Taking the whole county, it is seen that all of the subdivisions of the Silurian limestones outcrop within its limits and supply, ridge tops excepted, the aggregate of its soils. Elk ridge and its leading spurs mount to the level of the Highland Rim. The rocks of the crests are siliceous or flinty. The soils are gravelly, friable, of easy tillage, draining quickly, and moderately productive.

The growth of the county is heavy and rich, especially in the region of Elk ridge, including great oaks, poplar, elm, beech, sugar-tree, ash, linden, walnut, cherry, hackberry, locust, buckeye, and, on the ridges, chestnut. In addition, the glades supply the best of cedar timber. On the map of relative acreage in cotton the northern end and the southwestern corner of the county are seen to have had in 1879 the greater number of acres in cotton. The southeastern corner is the only part without the cotton-producing region. Cotton is shipped to Nashville by rail at $1 50 or by wagon at $2 per bale.

ABSTRACTS FROM REPORTS

J. B. EZELL (Spring Creek and Duck River lands, northeastern part of the county.—For soils cultivated in cotton, etc., see page 33).—Cotton grows from 2 to 4 feet high, 4 feet being the best. Continued wet weather inclines the plants to run to weed, for which the remedy is topping. Seed-cotton product per acre on fresh land is from 800 to 1,000 pounds, 1,660 pounds making a bale of 475 pounds, but the staple does not rate as high as old-land cotton. After two years' cultivation the product is 1,000 pounds, 1,600 pounds making a bale. Rag-weed is troublesome. One-fiftieth of the land lies turned out, and would produce well if taken in again. Slopes wash some, but not seriously.

J. F. BRITTAIN (northeastern part of the county).—We select ground, old and new, having as much sand as possible. The chief soil makes up two-thirds of the lands, and extends off 25 miles in different directions. The growth is beech, poplar, and walnut. The chief crops are corn, cotton, wheat, and oats. The land is best adapted to corn and wheat. Cotton forms one-fourth of the crops. The remedy for running to weed is deep plowing near the stalk. The seed-cotton product per acre on fresh land is 800 pounds, 1,545 pounds making a 475-pound bale; staple rates as low middling. After six years' cultivation the product is 600 pounds, 1,485 or 1,545 pounds making a bale; seed lighter, with more lint than on new ground. Weeds are rag-weed, foxtail, and crab-grass. Very little land lies turned out, and would produce well if taken in again. Washing has been checked by sowing grasses, also by horizontalizing and hillside ditching, with good success.

W. B. GLENN (northeastern part of the county).—The lands are generally level for miles around, and the soil of the uplands is much alike. The chief soil cultivated in cotton is the richest upland, making about two-thirds of the lands. The growth is white and black oaks, ash, hickory, sugar-tree, dogwood, and some poplar. Cotton forms about 20 per cent. of the crops. Seed-cotton product per acre, in good seasons, on fresh land, is from 1,000 to 1,200 pounds, 1,660 pounds making a 475-pound bale; staple rates low middling.

MAURY.

Population: 39,904.—White, 21,731; colored, 18,173.

Area: 590 square miles.—Woodland, all.

Tilled lands: 216,066 acres.—Area planted in cotton, 21,748 acres; in corn, 85,496 acres; in wheat, 43,510 acres; in oats, 6,068 acres; in rye, 286 acres; in tobacco, 72 acres.

Cotton production: 8,912 bales; average cotton product per acre, 0.41 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

Maury ranks third among the counties of the basin in amount of cotton produced in 1879. Every civil district contributed to the aggregate. The county has a general pentagonal form, with its base resting upon Giles and Lawrence (mostly upon the former) and its center lying in a line running south-southwest from Nashville. The great cultivated area of the county, and the greater body of it, is walled in on the south, west, and northwest by a complete semicircle of bold highlands—Elk ridge on the south, and the edges and spurs of the Highland Rim on the west and northwest. Could one be sufficiently elevated above Columbia, the bold semicircle would come in view, sweeping more than half way round the horizon. To the west-northwest might be discovered a gap made for the egress of Duck river. To the west and southwest the eye, before reaching the distant ridges, would range over a wide, nearly level expanse of one of the grandest bodies of farming lands in the state. To the northwest the ridges would be nearer and more distinct, the cultivated lands being more encroached upon here by the highlands than elsewhere.

Turning about and directing the eye to the northeast, east, and southeast, the view changes. The ridges are absent, and the country becomes undulating or, in the distance, level to the very borders of the county.

The extreme eastern section of the county, in the region of Duck river, abounds in cedar glades, among which are limited areas of red lands, such as occur in Marshall and Rutherford. The rocks underlying the red lands are the "central limestones", the lowest geologically found in the basin. Then above these come the flaggy rocks of the cedar glades. Starting with this section of red lands and the more extensive glades as a central area, and proceeding radially over the county to the semicircle of highlands on the borders, belts of lands will be passed over corresponding to concentric outcrops of all the remaining subdivisions of Silurian limestones enumerated on page 29, under the Central Basin. Outside of the red lands and cedar glades is first a wide belt of the lands based on the Carter's Creek limestones. The belt extends to Columbia, and southward toward Culleoka. It supplies many good farming areas, and many upon which the thick-bedded and light-colored limestones crop out in blocks and ledges. Outside of this again come benches and tables of sandy lands, resting upon the sandy limestones of the Orthis bed. The latter graduate without any special line of demarkation into the highly fertile lands of the lower layers of the Nashville series. And here we find the broad expanses of undulating and level "poplar" lands, like those of the Polk and Frierson settlements and Big Bigby creek, which have given so much character to the

southwestern part of Maury as an agricultural region. North of Duck river and west of Columbia, and also in the southern part of the county, this belt is more rolling, often becoming hilly. Proceeding to the foot of the semicircle of highlands, the country becomes at all points broken and hilly, and valleys and coves, interlocked with ridges, especially on the northern side of Duck river, are met with, but all are based on the rocks of the Nashville series, and are rich nearly to the tops of the ridges. The ridges are capped with siliceous and flinty strata. Their soils are gravelly and mellow, though thin and but moderately productive.

I have said nothing of bottom lands. I can only add that Maury has a fair quota of these along Duck river and the numerous creeks, adding much to the agricultural capacity of the county.

The native growth and crops are given in the abstracts of correspondents. On the map of relative acreage in cotton the belt of greatest area planted in cotton runs through the middle of the county. It is chiefly located on the soils of the Nashville limestones. Cotton is hauled to Columbia in wagons at 50 cents per bale, or shipped to Nashville at $1 per bale.

ABSTRACTS FROM REPORTS.

D. F. WATKINS AND L. E. POLK (Big Bigby lands, western and southwestern part of the county).—On new land cotton is liable to be too late unless the fall is very dry. Old lands are preferred. The soils cultivated in cotton are: (1) Yellow or poplar; (2) lowland, mostly black. The yellow or poplar is the chief soil, forming two-thirds of our lands, and extending from 5 to 15 miles in different directions. The growth is poplar, beech, oak, ash, walnut, sugar-tree, hickory, cherry, linden, with a dogwood and hornbeam undergrowth. The soil is a gravelly clay loam; the subsoil, a tough yellow clay, which bakes when exposed, but by cultivation becomes like the surface soil, and is underlaid by limestone at from 1 foot to 15 feet. Tillage is not troublesome in dry seasons, but rather difficult in wet. The chief crops are corn, cotton, and wheat, but the soil is best adapted to corn. About one-fourth of the crops is cotton. Plants grow to 3 and 6 feet, but are best at 3 feet, and incline to run to weed in wet seasons on rich, new (or bottom) lands, which is restrained by constant work to the last of July. The seed-cotton product per acre on fresh land is from 500 to 1,500 pounds, 1,780 pounds making a 475-pound bale; staple rates middling. The weeds are crab-grass, hog-weed, and purslane. No land lies turned out, but is generally seeded to wheat, oats, or barley, followed by clover, when it produces finely. The slopes do not wash seriously.

J. W. FRIERSON AND LEON FRIERSON (Big Bigby lands, southwestern part of the county).—For general statements, kinds of soils, etc., see page 35).—On the *mulatto or dark loam soils* cotton grows to 2 and 3 feet, 3 feet being the best. Some topping is done to restrain the plants. The seed-cotton product per acre on fresh land is from 1,000 to 1,500 pounds, 1,900 pounds making a 475-pound bale; staple rates low middling. After twenty years' cultivation the product is from 500 to 800 pounds per acre, according to the care taken of the land, 2,140 pounds making a bale. The weeds are careless-weed, smart-weed, cocklebur, and rag-weed. Very little land lies turned out; need never be turned out. Slopes wash on old thin lands. Horizontalizing and hillside ditching have been done, with indifferent success in most cases.

On the *black porous soil* the cotton raised is very productive at 4 feet, but the crop is uncertain. (Seed-cotton product and other details as under first soil.)

The *gravelly soil* occurs in a few spots, and has a growth of white and pin oaks and a few poplars. It is a gravelly yellow loam with a stiff clay. The subsoil is underlaid by gravel and limestone at from 3 to 6 feet. About one-fourth is planted in cotton. The seed-cotton product on fresh land is 1,000 pounds, 2,010 pounds making a bale; staple rates low middling. After twenty years' cultivation the product is from 300 to 500 pounds. (Other details as above.)

J. B. WILKES (Fountain Creek lands, southeastern corner of the county).—The lands vary; some yellow sandstone (Orthis bed) lands, some dark limestone. From 5 to 100 acres in places are tillable, and all are planted in cotton. The growth is poplar, oak, ash, beech, elm, sugar-tree, hickory, etc. The soils contain sometimes flinty gravel, are easily tilled in wet or dry seasons, and are early and warm when well drained. The chief crops are cotton, wheat, oats, barley, and corn, the soils being well adapted to all. Plants are restrained when necessary by topping. The seed-cotton product per acre on fresh land is from 800 to 1,200 pounds, 1,545 pounds making a 475-pound bale; staple rates low middling. Weeds are careless-weed and crab-grass. Very little land lies turned out. Such land, when taken in again, would produce well. Slopes wash seriously in some localities, but the valleys are not injured.

W. O. GORDON (lands of Carter's creek, north of Columbia).—On the mulatto or poplar uplands cotton grows to 3 feet. In warm, rainy seasons plants incline to run to weed, for which no remedy is used. The seed-cotton product per acre on fresh land is 800 pounds, 1,780 pounds making a 475-pound bale; staple rates good ordinary. After five years' cultivation the product is 600 pounds per acre, 1,760 pounds making a bale; staple then rates as low middling. The weeds are rag-weed, crab-grass, and foxtail. Ten per cent. of the land lies turned out. If taken in again it would require green fertilizers for its restoration. Slopes wash seriously, but the valleys are injured thereby to no great extent. Efforts are made to check the damage by horizontalizing, hillside ditching, and the use of wheat straw, and increased acreage of wheat is sown for this purpose.

On the *gravelly hill land* the growth is black gum, beech, hickory, elm, sugar-tree, walnut, and in some places black locust. Cotton grows to 3½ feet, and frequently remains green two or three weeks longer than that on the first soil. Seed-cotton product per acre on fresh land is 1,000 pounds, 1,800 pounds making a 475-pound bale; staple rates low middling. After five years' cultivation the product is 800 pounds.

On the *creek bottom soil* the growth is beech, oak, box-elder, hackberry, sycamore, and elm. It is a fine black loam, and is best adapted to corn and grasses. Cotton forms 10 per cent. of the crops. Plants grow to 3 feet, but get too weedy in wet seasons, for which no remedy is used. Seed-cotton product per acre on fresh land is rarely 1,200 pounds; the average is 500 pounds for all seasons, 1,840 pounds making a 475-pound bale. The weeds are morning-glory, smart-weed, rich-weed, and white-top.

WILLIAMSON.

Population: 28,313.—White, 15,922; colored, 12,391.

Area: 540 square miles.—Woodland, all.

Tilled lands: 158,970 acres.—Area planted in cotton, 11,859 acres; in corn, 61,122 acres; in wheat, 39,685 acres; in oats, 5,912 acres; in rye, 413 acres; in tobacco, 197 acres.

Cotton production: 4,538 bales; average cotton product per acre, 0.38 bale, 546 pounds seed-cotton, or 182 pounds cotton lint.

Among the counties of the basin Williamson ranked fourth in 1879 as a cotton-producing county. Its product was hardly a third of that of Giles. The county lies immediately west of Rutherford, the central county of Middle

Tennessee, and south of Davidson county. It has an ill-shaped area. If the northwestern corner were rounded off, its form would approach that of a semicircle, with its base tilted to the southeast, resting aslant against a sloping side of Maury.

The western end, including nearly or quite a third of the county, is on the Highland Rim, the remaining two-thirds being within the Central Basin. Although Williamson is among the richest counties of Middle Tennessee, and has many broad plateau belts and valleys of land inferior to none, yet it is, taken as a whole, a greatly broken county. Great ridges traverse many parts of it, and high hills are rarely out of view. Big Harpeth river is the trunk stream, into which all others, with inconsiderable exceptions, pour their waters. This river, rising just without the eastern boundary of Williamson county, enters the county near its southeastern corner and flows northwestward entirely through its area. Little Harpeth, in the northern part of the county, and West Harpeth, to the west of Franklin, the county-seat, the first flowing westerly and the second northerly, are important tributaries of the Big Harpeth. All these have unsurpassed farming lands along their courses and a great aggregate of them. The hills even bordering their valleys are rich to the tops. In the eastern part of the county the Big Harpeth has its bed chiefly in the Carter's Creek limestone, and at a few points in the lower glade limestone. With this exception the rocks of the Harpeth valleys belong to the Orthis bed and Nashville limestones, whose strata are so rich in all the elements that make a fertile soil. (See page 31, under the Central Basin.) On the same rocks rest the fine undulating lands south of Franklin, and indeed most of the best lands of the county.

In the eastern part of Williamson, over a considerable area, as at Triune, the Orthis bed has an unusual development. Its sandy layers (so-called sandstones) and shales are greatly thickened, and make the underlying rocks of table-areas upon which cotton is cultivated. The sandy, mellow, and poplar lands of these rocks make much of the upland country from Nolensville to Triune and southward to the beautiful valley of Grove creek. They occur in sections between the creeks, the immediate valleys of the latter usually cutting down to the heavy-bedded, light-colored limestones of the Carter's creek subdivision.

In the eastern end of the fourteenth district, about half way between Triune and Franklin, and touched on the south by Big Harpeth river, is a spot of cedar glades two miles or more across. It has all the characteristics—flaggy limestones, cedar timber, and black and reddish-yellow soils—of a Rutherford county glade. (*a*) In describing the lands of Williamson we might have begun with this spot as a geological and agricultural center and proceeded outward, for its rocks belong to the lowest subdivision outcropping in the county. First, without completely surrounding the cedar center and making much of the territory of the fourteenth district and of contiguous parts of districts to the south, is an irregular belt of country resting upon the Carter's Creek limestones, containing many upland areas of fair land, but much interspersed with tracts spotted and slopes terraced with naked rocks. Outside of this again come the sandy benches of the Orthis bed, the lands of which, often thin at first, run back, especially to the north, west, and southwest, and blend with those of the Nashville series, giving the grand bodies of farming lands, valley plateau, and hill lands we have already noticed, the aggregate of which is equal to half the county. To these again in the west (west of West Harpeth) succeed the lands of the elevated Highland Rim, with its great expanse of "barreny" flatwoods cut into sections by mountain streams, some of which, like South Harpeth, have narrow and rugged but very rich valleys.

The growth and crops of the county are given in the abstracts of correspondents. On the map of relative acreage in cotton the belt of greatest percentage is a continuation of that in Maury, the whole belt lying mostly on the lands of the Orthis bed and the Nashville limestones. Cotton is shipped, by rail or wagons, to Nashville at from 75 cents to $1 per bale.

ABSTRACTS FROM REPORTS.

SAMUEL PERKINS (lands of Nelson's, Wilson's, and Arrington's creeks, eastern part of the county).—These lands alternate with ridges of light loam and dark limestone land. The particular lands of this region are considered unusually well adapted to cotton, and have a well-drained and warm soil. The lighter sandy loam produces a taller stalk, matures early, and is less inclined to blight. High on the hills the surface is covered with yellowish sandstone, blocks detached from a stratum underneath the soils. On hills higher than the sandstones blue limestones are seen, and on slopes below it are lighter colored limestones.

The soils cultivated in cotton are: (1) Brown light loam inclined to be sandy, with a yellow or red clay subsoil, mixed with sandy gravel and underlaid usually with sandstone at from 6 to 10 feet; (2) dark or black limestone, containing flinty gravel, and a subsoil of stiff yellow clay. The chief soil is the brown loam, making not quite half the lands. The ridges of this soil extend eastward 2 miles, ending in a limestone ridge. The growth is white and yellow poplar, black gum, ash, dogwood, white and red elm, white and black walnut, white and red oaks. The land is easily tilled in wet or dry seasons. Cotton grows to 2 and 4 feet; best at 2½ and 3 feet. Seed-cotton product per acre on fresh land is from 800 to 1,200 pounds; on land cultivated twenty years, if rolling, or slopes, and neglected, from 250 to 500 pounds, or if well cultivated from 500 to 1,000 pounds. Very little land lies turned out.

The dark limestone soil makes about 60 per cent. of the lands, and occurs generally throughout the county. The growth is sugar-tree, white ash, box-elder, black walnut, red elm, and red oak. The seed-cotton product per acre on fresh land is from 600 to 1,000 pounds.

J. S. CLAYBROOKE, H. B. HYDE, AND W. L. JOHNSON (lands of Wilson's creek and Harpeth river).—Uplands are quick, especially the black, flinty, rolling lands, and bolls mature early. The bottoms are generally narrow, and cotton on them grows too much to stalk and is liable to be killed by frost. When, however, the frost is late and the fall is warm and dry the bottoms will yield nearly a bale to the acre. The soils cultivated in cotton are: (1) Black gravelly upland, limestone land; (2) sandy upland, sandstone and limestone land, with poplar as the prevailing growth; (3) black bottoms, on which cotton does not open. (Details much as in preceding abstract.)

T. F. P. ALLISON (lands of Grove creek, southeastern part of the county).—There are many kinds of soils in this district. The flinty gravel and yellow sandstone soils are the best both for cotton and wheat; the black loam is best for corn. These make about 80 per cent. of the lands. The growth generally is beech, elm, sugar-tree, poplar, white oak, walnut, and, on the high ridges, chestnut. The chief crops are wheat and corn. The soil is adapted to a variety of crops. One-sixth of the crops is cotton. The seed-cotton product per acre on fresh land is 1,800 pounds, 1,780 pounds making a 475-pound bale. The staple on old land is the best. One-tenth of the land lies turned out. If taken in again and broken in the fall, and rebroken in the spring, it would produce good corn, but not cotton the first year.

a A spot of cedar timber and glade limestone occurs in the extreme eastern angle of the county as we enter Rutherford, and another about Nolensville, on Mill creek, in the northwestern corner of the county.

S. A. POINTER (lands of Aenon and Harpeth creeks and of Duck and Big Harpeth rivers, southern part of the county.—For remarks and kinds of soils, see page 34).—On the mulatto poplar soil cotton grows from knee to shoulder high; waist high is the best. To prevent plants from going to weed, wet and roll the seed in plaster, plant early, and top the stalks in August. The seed-cotton product per acre on fresh land is from 700 to 1,500 pounds, 1,660 pounds making a 475-pound bale; staple rates middling. After fifteen years' cultivation the product is 500 pounds per acre, and even lower; yet if not plowed too wet it is injured less than any other crop; have known it planted in the same field for forty years. Staple on old land is somewhat shorter, but the yield is about the same. Foxtail and crab-grass are the most troublesome weeds. Little or no land lies turned out. Land that has been lying out, if not too badly washed, produces finely. Land lying out washes badly, and valleys are injured very little, if at all. Hillside ditches are often cut, with good success.

The light sandy soil lasts but a few years, even where cultivated carefully. Very little cotton is planted. Seed-cotton product per acre on fresh land is from 500 to 800 pounds, 1,660 pounds making a 475-pound bale; staple rates low middling. After fifteen years it would not sprout pease, and is too poor to grow weeds. Grasses alone are troublesome.

BROADWELL BROTHERS (northeast of Franklin).—The mulatto or poplar soil is the one almost universal here, and has a growth of poplar, black walnut, sugar-maple, and beech, with an undergrowth of papaw. The soil is a light gravel-clay loam of a mahogany color from 6 to 12 inches thick. The subsoil, a gravelly clay, becomes loose when exposed to the air and frost, and is underlaid by limestone at from 2 to 20 feet. The crops are cotton, corn, and wheat. The soil is best adapted to the last two. Cotton forms one-sixth of the crops. Plants grow to 3 feet; best at that. Topping is used to restrain the plants if need be, but is of no benefit unless followed by dry weather. The seed-cotton product per acre on fresh land is from 1,200 to 1,500 pounds, 1,840 or 1,900 pounds making a 475-pound bale; staple rates middling. After thirteen years' cultivation the product is 600 pounds per acre, 1,840 pounds making a bale; staple is shorter and finer, but thicker on the seed, and the seed lighter. Very little land lies turned out, and if taken in again would produce well. Slopes wash to some extent. A little horizontalizing and hillside ditching is done, with good success.

RUTHERFORD.

Population: 36,741.—White, 20,248; colored, 16,493.
Area: 590 square miles.—Woodland, all.
Tilled lands: 200,049 acres.—Area planted in cotton, 32,657 acres; in corn, 75,753 acres; in wheat, 29,250 acres; in oats, 6,482 acres; in rye, 483 acres; in tobacco, 47 acres.
Cotton production: 12,414 bales; average cotton product per acre, 0.38 bale, 543 pounds seed-cotton, or 181 pounds cotton lint.

Rutherford, one of the counties of the basin, stands second only to Giles in the number of bales produced in 1879. It is first in number of acres planted in cotton; a fact which, taken in connection with the above statement, is more to the credit of Giles than of Rutherford. Both in these respects are much ahead of any other in the basin, only one county indeed, Maury, making a distant approximation to them. The county would be roughly square in form and with the cardinal points if the sharp northwestern corner were cut off to the north. It is the central county of Middle Tennessee, and indeed of the state. The central part of the basin lies within its area a few miles to the west of Murfreesborough.

The agricultural areas of Rutherford are arranged quite symmetrically. We have first a large level or undulating area of red cotton lands, elliptical in form, lying centrally and diagonally within the county. The town of Smyrna is near its northern end, Murfreesborough a few miles east of its center, and Christiana (points on the Nashville and Chattanooga railroad) at the southern end. The area along its principal axis is 24 miles in length and 12 in width, and is equal in square miles to a third of the county. The soil, when fresh, is a brown-clay loam, becoming red after several years' cultivation, owing to an admixture of the red clay subsoil. It is mellowed by flinty grains and gravel from the chert of the underlying rocks. The latter are called the "central limestones", and are the lowest rocks exposed in the basin. (See page 29, under the Central Basin.) The native growth of these lands, which we may call "central lands", is a species of hickory, large red and white oaks, common locust, honey-locust, black walnut, cherry, post oak, sugar-tree, poplar, box-elder, mulberry, and hackberry, with dogwood, red-bud, hornbeam, and cane.

Then, secondly, around the central area is a remarkable belt of cedar glades, inclosing it (quoting from a previous page) as a frame its picture. (*a*) These glades are in the aggregate equal to another third of the surface of the county. They often rise in low ridges above the central lands. The rocks which make them are known as glade limestones. The glades have little value outside of the great cedar timber they supply. (See page 29.)

The glade belt extends out to the northern boundary of the county, and even beyond it into Wilson. It also reaches the western boundary at certain points. In all other directions, after passing the glade area, we intersect within the county the lands of a second great belt or ring, that based on the Carter's Creek limestones. This belt is complete in itself, but the northern portion is thrown into Wilson county, and much of its western portion into Davidson and Williamson by the extension of the glades in those directions. The lands, though in the main of second class, supply, when lying well, very desirable farming regions and cotton soils. They are, however, often hilly and rough from outcropping rocks. In Part I of the report (place referred to above) they are more fully described.

The lands of the second belt constitute most of the county remaining outside of the cedars. In the southeastern corner, however, there succeed bodies of the mulatto lands of the Orthis and Nashville limestones. This part is rolling, at points hilly, and includes several large ridges. Within the area of the second belt, at different points in the county, isolated hills or groups of hills, like Versailles knob, in the southwestern part of the county, rise up, whose slopes show Orthis and Nashville rocks and their characteristic soils. Finally, beyond all, a section of the eastern boundary a little north of the southeastern corner rests upon the high edge of the Highland Rim.

On the map of acreage the central lands are prominent as to percentage of land in cotton. Table I shows a great increase in the product of 1879 over that of 1869. Allowing for difference in weight of bales, the increase is 76 per cent.

Cotton is shipped, by rail or wagon, to Nashville at from 50 cents to $1 50 per bale.

a A little north of Florence station a low ridge of cedars extends across the central lands, cutting off really the northern end. This is not regarded in the general account above.

ABSTRACTS FROM REPORTS.

C. F. VANDERFORD, W. N. MASON, J. S. GOOCH, AND DR. R. B. HARRIS (lands of Overall's and Stewart's creek and east and west forks of Stone's river, northwestern part of the county).—The uplands of these streams are our best. Cotton lands do not vary much, as the country is generally level. The soils cultivated in cotton are: (1) Yellow (red) loam, with stiff clay subsoil; (2) yellow gravelly soil, with the same subsoil; (3) black coarse soil, not often used. The first, *the yellow (or red) loam*, makes more than half the lands. The subsoil contains flinty gravel, underlaid first by gravel and then by limestone at from 3 to 10 feet. Land is not easily tilled in wet weather; more easily in dry. The chief crops are cotton, corn, and wheat; also sorghum-cane, oats, and potatoes to a limited extent. One-fourth of the farming land is put in cotton. Plants grow to a height of 3 feet; this is the best. Wet weather inclines the plants to run to weed, which is restrained sometimes by reducing the ridge. Seed-cotton product per acre on fresh land is from 800 to 1,000 pounds, 1,660 pounds making a 475-pound bale; staple rates low middling. After twenty years' cultivation the product is from 600 to 800 pounds, 1,780 pounds then making a bale; staple rates inferior. The weeds are crab-grass and foxtail. None of the land lies turned out, but is put in clover. Slopes wash, but are easily checked. In a few instances horizontalizing has been done, with good success.

The *yellow gravelly soil* makes one-fourth of the lands. One-fourth of this soil is planted in cotton. Plants average 2 feet. The seed-cotton product per acre on fresh land is from 400 to 600 pounds, 1,425 pounds making a 475-pound bale; staple rates low middling. After fifteen years' cultivation the product is from 200 to 300 pounds. Crab-grass is troublesome. One-half or more of the land is in clover.

The *black coarse soil* comprises about a fourth of the lands, and is mostly cultivated in corn.

J. W. SMITH, DR. J. W. DAVIS, ROBERT BRUCE, W. S. BATTEN, D. M. NELSON, AND A. H. SANDERS (land of Stewart's creek and Stone's river.—For remarks, kinds of soils, etc., see page 33).—On the brown upland soil with red clay subsoil cotton grows from 2 to 4 feet high; best at 3 feet. A wet autumn, after a dry summer and deep cultivation, incline the plant to run to weed, for which shallow plowing is the remedy. The seed-cotton product per acre on fresh land is from 800 to 1,200 pounds, 1,660 pounds making a 475-pound bale; staple rates well. After twenty years' cultivation the product is from 600 to 800 pounds; staple compares well with that of fresh land. The weeds are crab-grass and morning-glory. About one-fifteenth of the land lies turned out; taken in again it would produce well if not washed. Slopes wash seriously in some places, but can be restored; valleys are sometimes injured, but to no great extent. Horizontalizing and throwing brush in the gullies have been practiced with benefit. The second soil does not differ enough from the first to make a description necessary. There is very little of the third soil.

A. M. MCELROY (county generally).—In 1867-'68 I was the cotton weigher for Rutherford county. The crop of 1867 was the largest ever made in the county. My books show that I weighed for that year over 20,000 bales. The cotton lands lie on the water-courses, the three prongs of Stone's river being the principal ones. The soils cultivated in cotton are: (1) Dark mulatto, one-tenth of the land in cultivation, from 6 to 10 inches thick, with a subsoil of yellow clay; (2) lighter yellow—more of this than of any other kind; (3) red, like the second in productive capacity.

DAVIDSON.

Population: 79,026.—White, 47,678; colored, 31,348.
Area: 500 square miles.—Woodland, all.
Tilled lands: 139,166 acres.—Area planted in cotton, 3,224 acres; in corn, 52,764 acres; in wheat, 18,651 acres; in oats, 8,141 acres; in rye, 379 acres; in tobacco, 41 acres.
Cotton production: 1,333 bales; average cotton product per acre, 0.41 bale, 588 pounds seed-cotton, or 196 pounds cotton lint.

Davidson claims distinction inasmuch as the capital stands within its area. The county is pyramidal in shape, with a concave base, and it may be compared to a military cap seen in profile, with its sharp southwestern corner as the visor. The Cumberland river, with a general course to the west-southwest, winds through its area in a remarkably serpentine manner, the huge folds inclosing alternately on the two sides large and rich bodies of land. Such are Jones', Neely's, McSpadden's, Cockrill's, White's, and Bell's bends, the first being the most easterly and the last the most westerly. The surface of the county is in general rolling, with many rich valleys and plateau areas. Some parts are hilly; others almost mountainous, with high ridges.

The greater part of the county is within the area of the basin. The western part, equal to one-third or more of the whole, is properly on or within the range of the Highland Rim. We may, indeed, refer all of the county west of the valleys of White's creek, on the north side of the Cumberland river, and Richland creek on the south side, to the rim. But this great belt is not a continuous flat highland. Its southern part is intersected by the valleys of the Cumberland, Harpeth, and West Harpeth rivers, and is otherwise badly cut up by the valleys of creeks. North of the valley of the Cumberland the high belt is little dissected, and presents here a large block of flatwoods and rolling highlands, with the characteristic half-size oak growth and thin soils. Many spurs start out eastward from the highlands and interlock with scores of exceedingly fertile valleys. These, with but few exceptions, soon break down into lines of rich hills and then into level or rolling uplands. One of the exceptions is the prominent ridge dividing the waters of the Cumberland and Harpeth rivers.

Reaching in a direction nearly north and south through the middle of the county, between the valleys of White's and Richland creeks on the west and the Louisville and Nashville and the Nashville and Decatur railroads on the east, is a central belt of the county, averaging 5 or 6 miles in width, that is unsurpassed in fertility, and is the pride of the county. The land has the characteristic mulatto soil of the Nashville limestone, with a varied, heavy native growth. (See page 32, under the Central Basin.) But little cotton is raised upon it.

The part of the county east of the railroads mentioned, and extending to within a few miles of the Rutherford line and a corner of Wilson county, may be regarded, in general, as a wide-spreading table upland area with mellow, warm, and early lands based on sandy limestones. It is on this upland that most of the cotton of the county is raised. Within it are Jones' bend, the Hermitage, and the uplands along the Murfreesborough and Nolensville turnpikes. The rocks determining its table topography and giving character to it as an agricultural region are in the main the sandy strata of the Orthis bed. (See page 31.) Here and there swells and hills rise up above the plateau and locally contribute rocks and soils of the overlying Nashville series. The great table is cut into sections by the valleys of the Cumberland and Stone's river and Mill creek, and their most important tributaries. These streams have cut through the capping sandy rocks and made their beds in the light-colored and heavy-bedded

limestones of the Carter's creek subdivision. This conformation and arrangement of formations and surface, so different from that west of Nashville, is made possible by the gradual rising of the strata as we go eastward. Westward the Orthis bed sinks below the river.

In the extreme eastern part of the county, contiguous to the Rutherford line and a corner of Wilson, the part excepted above, the sandy lands grow thin and break away, giving place to those of the Carter's Creek limestones, which become predominant. At a few points the county even touches the great cedar-glade belt of Rutherford.

A reference to the map of relative acreage will show that part of Davidson in which cotton is cultivated. The northeastern part is the area of greatest production. The product of 1879 was but little greater, 12 per cent., than that reported for 1869. In 1879 the product of Davidson was only one-twelfth of that of Rutherford.

Cotton is shipped to Nashville at 50 cents per bale.

ABSTRACTS FROM REPORTS.

W. WEAVER, W. A. DONELSON, AND J. M. TURNER (lands of Cumberland river, northeastern part of the county).—The soils cultivated in cotton are: (1) Brown clay loam; (2) light sandy loam; (3) black loam with little sand. The *brown clay loam* forms one-half of the lands, and has a growth of oak, hickory, ash, walnut, beech, hackberry, maple, elm, and gum. Subsoil, clayey and gravelly, which turns to a top soil when thrown up, produces a growth of weeds the first year and makes fine summer turnips, and is underlaid by limestone at from 1 foot to 10 feet. The soil is early and warm, and is best adapted to grain. Cotton forms one-fifth of the crops, and grows to a height of 3½ feet. New or strong land and wet weather cause overgrowth. The seed-cotton product per acre on fresh land is 1,200 pounds, 1,520 pounds making a 475-pound bale; staple not so good as on old land. After thirty-nine years' cultivation the product is 800 pounds per acre; if the land does not wash, it ought to improve; 1,520 pounds make a bale; staple finer but shorter. Weeds are morning-glory, cocklebur, and rag-weed. One-tenth of the land lies turned out, and is generally worn to the rocks; if not, it could soon be revived by clover. Slopes wash seriously. We try to prevent it by horizontalizing, with moderate success. The *light sandy soil* forms one-fourth of our lands, extending half a mile in each direction. The growth is small swamp oak, holly, and beech. The soil is late and cold. One-third of the crops is cotton. The seed-cotton product per acre is one-half bale. The black limestone land is unfit for anything.

W. S. DONELSON (Hermitage, Cumberland River lands, northeastern part of the county).—The soils cultivated in cotton are the red clay and black limestone, forming three-fourths of the lands. One-tenth of the crops is cotton. The seed-cotton product per acre on fresh land is from 800 to 1,200 pounds, 1,660 pounds making a 475-pound bale; staple rates low middling. After twenty years' cultivation the product is from 300 to 500 pounds per acre; staple is better. The weeds are careless-weed and crab-grass.

PHILIP EARHEART (Stoner's Creek lands, northeastern part of the county).—The soils cultivated in cotton are: (1) Black sandy; (2) flat lowland, partly overflowed; (3) light yellow sandy, ridge land. The *black sandy upland* is the best, and forms half the lands. Its growth is poplar, ash, oak, hickory, dogwood, elm, and papaw. One-third of the crops is cotton. The seed-cotton product per acre on fresh lands is from 1,000 to 1,200 pounds.

The *flat lowland* soil occurs up and down Stone's river and Stoner's creek. Its growth is overcup oak, hackberry, box-elder, sugar-tree, maple, willow, cottonwood, some hickory, and ash. Very little cotton is planted.

The *light sandy* soil forms one-fourth of the lands, and is productive, especially for cotton. Its growth is white and black oaks, some poplar, persimmon, dogwood, black haw, hickory, and ash. One-fourth of the crops is cotton. The seed-cotton product per acre on fresh land is from 500 to 600 pounds.

M. M. LEEK (Mill Creek lands, east of Nashville).—Our lands produce corn, wheat, clover, and some cotton, and are adapted to almost any crop. The seed-cotton product per acre on fresh land is from 800 to 1,000 pounds, 1,545 to 1,780 pounds making a 475-pound bale; staple rates low middling. After five years' cultivation the product is from 600 to 800 pounds per acre; staple is good ordinary. Crab-grass is troublesome.

B. GRAY (Hurricane creek, southeastern corner of the county.—For kinds of soils cultivated in cotton, etc., see page 34).—On the red clay soil cotton grows to a height of from 1 foot to 4 feet; best at from 2½ to 3 feet. Wet seasons or very rich land incline cotton to run to weed; topping is the only remedy used, and this is a doubtful one. The seed-cotton product per acre on fresh land, if the season is suitable, is 1,000 pounds, 1,545 pounds making a bale of 475 pounds. After ten years' cultivation the product is from 500 to 800 pounds per acre. Foxtail and crab-grass are most troublesome. Very little land lies turned out. The second soil is the black loam land. (Details much the same as above.)

WILSON.

Population: 28,747.—White, 20,292; colored, 8,455.

Area: 410 square miles.—Woodland, all.

Tilled lands: 170,229 acres.—Area planted in cotton, 3,191 acres; in corn, 68,468 acres; in wheat, 32,983 acres; in oats, 9,978 acres; in rye, 852 acres; in tobacco, 361 acres.

Cotton production: 1,272 bales; average cotton product per acre, 0.40 bale, 567 pounds seed-cotton, or 189 pounds cotton lint.

Wilson lies north of Rutherford and west of Davidson county. Its northern boundary is for the most part the Cumberland river, and the county would be nearly rhombic in shape were not the southwestern corner cut largely away to Rutherford. The surface of the county is greatly varied. Alluvial lands occur at intervals along the streams, and rolling lands alternate with plateau areas and benches or great cedar glades. Some parts are hilly, and high, bold ridges are met with in the eastern and southeastern parts of the county.

The cedar glades are a marked feature in this county, as in Rutherford, Bedford, and Marshall. They are based on thin, flaggy limestones, cover many square miles, and have supplied a vast amount of superior cedar logs and timber. A great belt of glades, 10 miles or more across, comes out of Rutherford and extends, though with contracting width, northward through the central part of Wilson to Lebanon, the county-seat. Glades of limited extent, alternating with other areas, occur north and northwest and also east from Lebanon, and in the cedar regions patches of arable lands, with black and brown soils, are met with. The latter, with gravelly yellowish or reddish-yellow subsoils, are the most important, and are sometimes cultivated in cotton, especially in the southern part of the county. (*a*) The flaggy limestones of the cedars belong to the subdivision of the Silurian limestones I have denominated "glade limestones". (See page 30, under the Central Basin.)

a Occasionally spots of the red lands of the Central limestones, so extensively developed in Rutherford, are discovered. Their aggregate area, however, is very limited.

Next outside of the glades we have everywhere lands in valleys, belts, or sections of greater or less size, based on the heavy-bedded and light bluish-gray limestone, named "Carter's Creek limestone". (See page 30.) There is much of this in the angle of the county to the southwest of Lebanon, and many wide desirable valleys to the northwest of the same place, all within the cotton-producing portion of the county. The same lands occur in valleys to the north, east, and southeast from Lebanon; in fact, summarily, pretty well over the county. The alluvial and second bottom or gently sloping lands of these valleys, taken together, give to the county many superb farms noted for strength of soil and productiveness.

Again, in most of the county, highlands occur between the valley areas. These are often mere dividing ridges or lines of hills. In many portions, however, they are flat-topped ridges or plateau areas of greater or less extent. Their soils are sandy, and rest upon the sandy limestones (blending upward sometimes with the bottom layers of the Nashville limestones) belonging to the subdivision named on page 31 the "Orthis bed". The Lebanon and Nashville turnpike crosses such ranges, as at Silver Springs and Greenhill, and just without the county in Davidson, at the Hermitage. Others occur north and south of this line. They are known as poplar or hickory ridges, and they supply in this part of the county favorite cotton-growing tracts. (*a*) In the eastern part of the county they are also present. In this direction, however, many of the high ridges rise above the "Orthis bed" and contribute to the agricultural wealth of the county rich slopes of the mulatto lands characteristic of the Nashville limestones.

On the map of relative acreage in cotton it is seen that the cotton-producing portion of Wilson lies chiefly in the southwestern and western portion of the county; and further, that this portion is for the most part the northern end of the cotton-growing region of Middle Tennessee. Cotton is shipped to Nashville at from $1 to $1 50 per bale.

ABSTRACTS FROM REPORTS.

E. H. THORNTON (southwestern part of the county.—For remarks and kinds of soils cultivated in cotton, see page 33).—On the soils named cotton grows from 1 foot to 4 feet high, 3 feet being the best. Wet weather in August inclines the plant to run to weed, for which topping is the remedy. The seed-cotton product per acre on fresh land is 600 pounds, 1,660 pounds making a 475-pound bale; staple is coarse. After four years' cultivation the product is from 200 to 400 pounds, 1,545 pounds making a bale; staple is shorter but finer, and seed lighter. Crab-grass is troublesome. But little land lies turned out. Slopes wash seriously, but the valleys are not injured thereby until the soil on the uplands is exhausted. Horizontalizing has been tried with good success.

W. C. DAVIS AND TURNER VAUGHAN (lands of Spencer's creek and Cumberland river, northwestern part of the county).—The Cumberland River uplands cannot properly be considered hilly until we get east of the cotton region of this section. The soils cultivated in cotton are: (1) Brown poplar ridge, lying mostly on slopes; (2) red or limestone, mostly on level or gradually sloping plains; (3) yellow or red sandstone land. The chief soil, *"poplar" ridge*, makes about one-fifth of the lands, and occurs to the east, south, southeast, and southwest for 15 miles, but is largely broken up by other varieties. Its growth is poplar, walnut, dogwood, mulberry, oak, etc. Tillage is easy in wet or dry seasons, and the soil is early, warm, and well drained. The chief crops are corn, cotton, oats, wheat, and clover; but one-twentieth of the land is planted in cotton. Plants grow to a height of from 1½ to 2 feet. Excessive rain and thick planting may cause them to run to weed, but this may be restrained by early planting. The seed-cotton product per acre on fresh land is 1,000 pounds, 1,600 pounds making a 475-pound bale; staple rates good ordinary. After ten years' cultivation the product is 750 pounds, 1,660 pounds making a bale; staple not so good or fine. The weeds are smart-weed and crow-foot grass. Very little land lies turned out; if taken in again it would produce finely, and is easily restored, only requiring time. Steep slopes alone wash; valleys are injured more or less in proportion to the clay washed down. Little is done properly to check damage.

The *red or limestone soil* is perhaps not more than one-twentieth of the lands of this region. It occurs to the east, 10 miles; south and southeast, 20; southwest, 12. Any crop does well on this. (Other details as above.)

The *yellow or red soil* of sandstone land forms not more than one-fiftieth of our lands. One-twentieth of this land is planted in cotton. Under no circumstances does cotton incline to run to weed. (Details as under first soil.)

SUMNER.

Population: 23,625.—White, 16,294; colored, 7,331.

Area: 530 square miles.—Woodland, all.

Tilled lands: 139,980 acres.—Area planted in cotton, 732 acres; in corn, 49,245 acres; in wheat, 20,445 acres; in oats, 9,188 acres; in rye, 779 acres; in tobacco, 495 acres.

Cotton production: 317 bales; average cotton product per acre, 0.43 bale, 618 pounds seed-cotton, or 206 pounds cotton lint.

Sumner lies north of Wilson and Davidson counties, between the Cumberland river and the Kentucky line. Its area has nearly the form of a square, excepting that the southwestern corner protrudes to the west and the southeastern is encroached upon by Trousdale. The topography of the county is simple and its belts of land compact and easily comprehended. The northern portion of the county is on the Highland Rim, and the southern portion within the basin, the area being about equally divided between the two. The northern half is therefore elevated. Its lands, between the shallow valleys of the streams, are flat and "barreny", the timber small oaks and hickories, with chestnut, and the soils are thin and poor. Toward Kentucky the lands improve as the red soils of the Saint Louis limestones are approached.

South of the edge of the highland, or of "the ridge", as they call it in Sumner, to within a mile of the river, is a belt of mulatto lands averaging 5 miles or thereabout in width and extending eastward and westward through the county, the like of which is to be seen only in the grand belt, of which it is a part, lying along the foot and in front of the edge of the Highland Rim in Williamson and Maury counties. On the north side the lands of this belt are made hilly or rolling by spurs jutting out from the highland. Going toward the river, the county becomes less rolling, and often spreads out into the most beautiful farming tracts. These lands are based on Nashville limestones and rocks of the "Orthis bed". Nearest the river the sandy lands of the latter rocks generally predominate, and it was on these, in the southwestern corner of the county, that most of the cotton accredited to Sumner was raised.

a Often on the steeper slopes, where these lands break away as we pass to those of the Carter's Creek limestones below, the soil is very thin and poor, frequently presenting bare or "scalded" places along the hillsides.

Within a mile of the Cumberland, more or less, the lands we have noticed break away and give place to the immediate valley of the river. This valley supplies another but narrow and often rough belt of lands based chiefly on the Carter's Creek limestones. At a few points the sandy lands of the "Orthis bed" sink down to the level of the river. Rich alluvial bottoms occur at intervals along the river, and a fair proportion of them along the creeks of the county.

On the map of relative percentage the location of the cotton-producing lands is seen. It is a small area, and is at the extreme northern end of the cotton region of Middle Tennessee. Cotton is hauled to Nashville at 50 cents per bale.

ABSTRACTS FROM REPORTS.

J. G. MARTIN AND S. R. DOXEY (lands of Drake's creek and Cumberland river, southwestern part of the county).—On the yellow poplar soil cotton grows to a height of 3 or 4 feet, and at this height is most productive. In wet seasons plants incline to grow to weed, for which we know no remedy. Cotton is not planted on fresh land. After five or six years' cultivation the seed-cotton product per acre is from 1,000 to 1,200 pounds with good attention, from 1,660 to 1,780 pounds making a 475-pound bale; staple very fine. Crab-grass and foxtail alone are troublesome. No land lies turned out, but is sometimes clovered and grassed and then put in cotton. There is very little washing on slopes. Nothing of consequence is done to check it.

The second soil, dark loam or blue-grass soil, forms about half of our lands, and occurs for 5 or 10 miles in small and large farms. Growth, walnut, ash, oak, locust, and the like. The soil is a brown clay loam with a deep yellow clay subsoil; thickness, 6 to 8 inches. The subsoil is friable when exposed, becoming like the surface soil, and is underlaid by clay and rock at from 1 foot to 4 feet. The land is easily tilled, though not so easily as the first soil; is later than the first, and is well drained naturally. The soil is best adapted to blue grass and other grasses, corn, potatoes, and then cotton. Very little is planted in cotton. Plants grow to 18 and 30 inches, the last the best. Fresh land is not put in cotton. After five or six years the product per acre is from 800 to 1,000 pounds, 1,660 to 1,780 pounds making 475-pound bale. Grasses alone are troublesome. None of the land lies turned out, but all is planted in grass or clover. Very little washing occurs on slopes, and scarcely anything is done to check it.

HARRY SMITH AND J. G. MARTIN (lands of Drake's creek and Cumberland river).—There are a number of farms in this immediate vicinity having a red or yellow sandy soil adapted to cotton. Cotton is more successfully raised here than elsewhere in the county, due to a greater proportion of sand in the soil. The soils are: (1) Red or yellow sandy upland, either on level land or slopes; (2) brown-loam or blue-grass soil, suited to corn and grain; (3) black buckshot, very sleek in wet weather. The chief soil for cotton is the red or yellow sandy, making three-fourths of the land in this vicinity, and extending a mile and a half north, 3 miles east and west, and bounded on the south by the Cumberland river. Its growth is poplar, ash, oak, elm, walnut, some beech, dogwood, ironwood, etc. The soil is a fine sandy loam 6 inches thick. The subsoil is a yellow clay, which crumbles in the sun, but is almost impervious when undisturbed, and is underlaid by limestone at from 5 to 20 feet. The land is early and well drained. Cotton is the money crop, and the soil is best adapted to the staple. One-third of the crops is cotton. Plants grow to 2½ and 3 feet. Soil too rich or containing too much calcareous matter inclines the plants to run to weed, which some restrain by topping; but my plan is to use the hoe. The seed-cotton product per acre on fresh land is from 500 to 1,500 pounds, 1,780 to 1,900 pounds making a 475-pound bale; staple is best from old land. After forty years' cultivation the product on the farm I work is from 500 to 1,000 pounds, the same quantity making a bale. Crab-grass is very troublesome from the middle of June until fall. Very little land lies turned out. Cotton cultivation does not exhaust the land, excepting on slopes which wash. Slopes wash seriously in some places, but the valleys are rather improved thereby. Horizontalizing has been done with very good success.

CHEATHAM.

(See "Highland Rim, western subdivision".)

JACKSON.

(See "Highland Rim, eastern subdivision".)

MACON.

(See "Highland Rim, eastern subdivision".)

PUTNAM.

(See "Highland Rim, eastern subdivision".)

DE KALB.

(See "Highland Rim, eastern subdivision".)

COFFEE.

(See "Highland Rim, eastern subdivision".)

THE CUMBERLAND TABLE-LAND, THE VALLEY OF EAST TENNESSEE, AND THE UNAKA MOUNTAIN REGION.

These regions respectively embrace the following counties:

TABLE-LAND.—Fentress, Scott, Morgan, Cumberland, Van Buren, and Grundy.

TABLE-LAND AND VALLEY.—Marion, Sequatchie, Bledsoe, Hamilton, Rhea, Anderson, Campbell, and Claiborne.

VALLEY.—James, Bradley, McMinn, Meigs, Loudon, Roane, Knox, Jefferson, Union, Grainger, Hamblen, Hancock, Hawkins, Washington, and Sullivan.

VALLEY AND UNAKA.—Polk, Monroe, Blount, Sevier, Cocke, Greene, Unicoi, Carter, and Johnson.

The leading topographical and agricultural features of these great natural divisions of the state have been given in Part I of this report. They lie within the penumbral region of cotton culture; or, strictly, the valley of East Tennessee is a "penumbral region", while the other two, the Cumberland table-land and the Unaka Mountain region, both mountainous divisions, lay so feeble a claim to the designation that we may throw them out as non-producing areas. Their relations to cotton production are sufficiently given in the respective accounts given of them in Part I.

In the valley of East Tennessee, though the division has no county in which cotton can be considered as one of the chief crops, there are many isolated areas, especially in the southern and middle portions of the valley, in which from 1 bale to 70 bales were produced. One county, indeed (Hamilton), reports the respectable number of 143 bales. The distribution of these areas is best learned by a reference to the map of relative acreage. The entire constellation of colored spots and patches seen on this map, and lying east of the counties of Franklin, Grundy, Bledsoe, Cumberland, Morgan, and Fentress, is within the valley. The colored area in Marion is in Sequatchie valley, but Sequatchie belongs properly to the great valley. In Table I the product of the several counties from Marion, producing 35 bales, to Johnson, producing nothing, is given, and need not be repeated here. (*a*) The total production of the entire valley was in 1879 only 537 bales, an aggregate product less than that of the limited cotton-producing corner of Sumner county within the basin.

The soils of the valley have been noticed in the description of the division in Part I of the report. In many sections they would produce cotton well if the growing season were long enough to be relied upon. The cotton actually produced was cultivated upon a variety of them; but the yield, in the aggregate, was so small, and the areas concerned so scattered, that even if we had the proper data but little practically would come from a discussion of the relations. It will be observed upon the map that there is a general increase in cotton culture as we approach Georgia and Alabama. The valley is indeed "penumbral" to areas of higher percentage production in these states. An examination of Table I brings out the fact (allowing for errors in the column of cotton bales for 1870) that there was comparatively a great increase in the product of 1879 over that of 1869.

ABSTRACTS FROM REPORTS.

HAMILTON COUNTY, *J. M. Ellis:* The first and second bottoms and uplands of Chickamauga creek are considered. Cotton-growing, tried here for five years, seems satisfactory on the first and second soils. On low, rich bottoms there is too much weed, and bolls do not open. The soils used for cotton are: (1) Red soil, lying high and fair to the sun; (2) cherty gray soil, lying high; (3) bottom lands, not often planted in cotton. The chief soil is the *dark red soil*, and about half of our land consists of this kind. The growth includes oak, hickory, poplar, and ash. The soil is about 12 inches thick, but often less, and is underlaid by gravel and limestone (dolomite) at from 1 foot to 10 feet. The chief crops are corn, oats, clover, red-top, and wheat, all of which, excepting wheat, do well. About two acres in a hundred are planted in cotton, the plants attaining a height of 2½ feet. Wet weather and deep plowing promote the growth of weeds, which is restrained by shallow plowing and the free use of some good fertilizer. The yield of seed-cotton on fresh land is from 600 to 800 pounds per acre, of which it requires 1,485 pounds for a 475-pound bale, the staple rating as good ordinary. On land that has been in cultivation the product is from 400 to 600 pounds, requiring the same number of pounds as on fresh land for a bale, the staple comparing favorably with that of the first soil. Rag-weed and crab-grass are most troublesome. The second soil, *the gray cherty*, forms a fourth of the lands. Its growth is oak and hickory principally. It is a sandy, gravelly, grayish loam, sometimes black, 2 or 3 inches thick, underlaid by limestone (dolomite) at from 1 foot to 5 feet. It is tilled more easily in wet seasons than in dry. The subsoil is heavy, with angular gravel. The soil is best adapted to corn and clover, but about 2 per cent. of it is planted in cotton, which grows 2½ feet high. The seed-cotton yield is from 400 to 600 pounds per acre, requiring the same as that on the first soil for a bale, the staple rating as low middling. After two years' cultivation the land produces from 600 to 800 pounds per acre, the staple being the same. The weeds are rag-weed and crab-grass. About 5 per cent. or less now lies turned out. Such land tends to wash, and hence does not do so well when again cultivated. No efforts have been made to prevent washing.

JAMES COUNTY, *J. A. Green:* The first and second bottoms and uplands of Ooltewah creek and of the Tennessee river are referred to. The climate here is too cold and generally too wet for cotton. It does well occasionally on the mulatto uplands when the fall is dry. The soils cultivated in cotton are: (1) The mulatto uplands; (2) gray sandy land, or black gravelly upland; (3) black land. The first kind makes the largest proportion of the lands. Its growth is hickory, oak, and poplar, with occasionally pine forests. The chief crops produced are corn, wheat, oats, potatoes, and vegetables. Not more than one-twentieth is put in cotton. About 1,425 pounds of seed-cotton are required for a 475-pound bale, the staple rating as fair in the market. The most troublesome weeds are rag-weed, cocklebur, and Spanish needles.

POLK COUNTY, *Erly Boyd:* Cotton has but recently been cultivated in this county, but to no great extent. It is planted in the light sandy bottoms of the Hiawassee and Oconee rivers and in lands of Conasauga creek. The lands are best adapted to corn. Cotton grows from 2 to 4 feet in height. From 1,000 to 1,200 pounds of seed-cotton are produced per acre, of which from 1,600 to 1,900 pounds are required for a 475-pound bale. The staple rates as good. The troublesome weeds are rag-weed, crab-grass, and morning-glory.

a In the study of this table, and also of Table II, the general heading must not mislead. So far as cotton is concerned, all reported from Marion, inclusive, to the end pertains, as stated substantially above, to the valley of East Tennessee.

PART III.

CULTURAL AND ECONOMIC DETAILS

OF

COTTON PRODUCTION.

REFERENCE TABLE

OF

REPORTS RECEIVED FROM TENNESSEE COUNTIES.

ALLUVIAL PLAIN OF THE MISSISSIPPI RIVER.

(Received during 1880.)

Lake.—(1) W. H. ANDERSON, Tiptonville, July 10; refers to county generally. (2) C. M. PEACOCK, Tiptonville, June 28; civil district No. 4, on eastern side of county. (3) D. WAGONER, Tiptonville, May 31; county generally. (4) R. S. BRADFORD, Tiptonville, May 15; county generally. (5) L. DONALDSON, Tiptonville, July 21; Mississippi alluvium, margin of Reelfoot lake. (6) J. W. FOWLER, Tenbrook, July 1; civil district No. 3. (7) R. M. DARNALL, Marr's Landing, April 2; civil district No. 1, northwestern part of county.

Dyer and Lauderdale.—(8) C. H. PATE, Cottonwood Point, Missouri, July; alluvial and cultivated belt along the Mississippi.

ALLUVIAL PLAIN OF THE MISSISSIPPI RIVER AND PLATEAU SLOPE OF WEST TENNESSEE.

Lauderdale.—(9) JOE L. LEA, Fulton, May 3; civil district No. 4, southwestern corner of county; Mississippi and Hatchie alluvium; Hatchie second bottoms; uplands of Tipton and Cane creeks and of the Hatchie. (10) I. A. LACKEY, Ripley, April 21; Cane creek and river lands. (11) J. F. YOUNG, Double Bridges, April 22; county generally. (12) J. J. ALSTON, Glimpville, June 1; southern part of county. (13) P. T. GLASS, Ripley, April 9; civil district No. 1, southeastern part of county; Hatchie lands and Mississippi alluvium.

PLATEAU SLOPE OF WEST TENNESSEE.

Lauderdale.—(14) R. L. HALLIBURTON AND J. C. MARLEY, Ripley, April 1; civil district No. 2, eastern part of county. (15) E. R. OLDHAM, Ripley, May 1; civil district No. 2, eastern part of county; lands of Cane creek. (16) F. T. RICE, Durhamville, April 1, southeastern part of county; waters of Hatchie river. (17) J. H. FLOWERS, Henning, July 12; civil district No. 3, southeastern part of county. (18) W. W. HURT, Double Bridges, August 1; northeastern part of county.

Dyer.—(19) D. C. CHURCHMAN, Newbern, June 19; civil district No. 6, northeastern part of county. (20) SMITH PARKS, Newbern, April 3; northeastern part of county. (21) L. M. WILLIAMS, Newbern, March 25; northeastern part of county, between the Obion and Forked Deer rivers. (22) A. HARRIS, Newbern, January 3; northeastern part of county.

Tipton.—(23) Dr. W. H. HILL, Covington, April 19; civil district No. 1, northern part of county. (24) J. U. GREEN, Covington, April 14; civil district No. 1, northern part of county. (25) S. P. DRIVER, Covington, June 26; civil district No. 1, northern part of county. (26) Dr. T. W. ROANE, Covington, April 30; lands of Beaver Dam creek and of Big Hatchie. (27) J. H. SHINAULT, Mason, April 12; civil districts Nos. 8 and 9, southern part of county. (28) A. W. SMITH, Brighton, April 22; central and northwestern parts of county, Indian creek lands.

Shelby.—(29) DR. W. D. TUCKER, Lucy, April 17; civil district No. 3, northern part of county; Big creek lands. (30) H. L. DOUGLASS, Woodstock, April 26; northwestern part of county, lands of Big creek and Loosahatchee. (31) Dr. S. HAMMONTREE, Woodstock, April 1; civil district No. 4, lands of Big creek. (32) JAMES STEWART, Memphis, March; county generally. (33) W. H. NELSON, White Haven, April 16; part of county south of Memphis, Nonconnah and Hurricane lands and Mississippi alluvium.

Obion.—(34) J. H. McDOWELL, Union City, May 1; civil districts Nos. 10 and 13, north of Troy; Hoosier creek lands. (35) B. W. HERRING, Union City, July 1; uplands, western part of county. (36) J. S. MURPHY, Harris Station, April 17; northeastern part of county, between Obion river and Harris' Fork.

Fayette.—(37) J. B. THORNTON and A. L. PEARSON, Rossville, June 25; civil district No. 10, southwest corner of county and northeast part of district. (38) A. D. LEWIS, La Grange, March 25; southeastern part of county, Wolf river lands. (39) J. M. GALLAWAY, Gallaway, January 2.

Hardeman.—(40) WILLIAM RUSH, Pine Top, April 15; a part of county northeast from Bolivar, Piney creek lands. (41) E. E. LOW, Saulsbury, April; civil district No. 1, southwestern corner of county; Spring creek lands. (42) J. A. MANSON, Saulsbury, March 31; civil districts Nos. 1 and 10, southwestern corner of county. (43) O. B. POLK, Hickory Valley, April 30; civil districts Nos. 2 and 3, western part of county. (44) H. M. POLK, Bolivar, March 29; lowlands and uplands of Spring creek and Hatchie river.

Haywood.—(45) AARON WALKER, Brownsville, April 15; county generally. (46) F. A. LORD, Brownsville, March 1; civil district No. 7, center of county. (47) J. W. KERR, Brownsville, May 27; civil district No. 9, western part of county. (48) H. WILLIAMS, Brownsville, May 1; northwest part of county. (49) J. B. BRANTLY, Wellwood, April 10; civil districts Nos. 4 and 5, eastern part of county. (50) H. M. CLARKE, Wellwood, April 5; eastern part of county, between Forked Deer and Hatchie rivers. (51) Dr. H. C. ANDERSON, Carolina, March 29; western and northwestern parts of county. (52) J. M. SHAW, Brownsville, and Professor J. NELSON, Dancyville, April 15; civil district No. 4, eastern part of county.

Madison.—(53) D. R. ALLISON, Stephenson, June 30; eastern part of county. (54) J. D. PEARSON, Clay Brook, June 28; civil district No. 12, northeastern part of county. (55) S. M. OSIER, Pinson, May 1; southeastern part of county. (56) THOMAS INGRAM, Andrew Chapel, May 1; civil district No. 7, western part of county; Panther creek and Forked Deer lands. (57) E. C. HARBERT, Andrew Chapel, July 9; lands of Cypress and Johnson's creeks, western part of county. (58) J. Y. KEITH, Jackson, April 28; lands of Johnson's creek and Forked Deer river, western part of county. (59) J. J. BOON, Jackson, April 21; civil district No. 8, southwest of Jackson; Hopper's creek and Forked Deer lands. (60) T. C. LONG, Jackson, April 10; western part of county, Johnson's creek lands. (61) A. D. HURT, Jackson, July 1; western part of county, Johnson's and Cub creek lands. (62) M. V. B. EXUM, Carroll, June; northwestern part of county, Cane and Dyer Creek lands. (63) M. P. COLLINS, Carroll, April 3; civil district No. 11, northeast from Jackson. (64) G. C. BUTLER, Medon, June 25; southern part of county, Clover creek lands.

Crockett.—(65) T. J. WOOD, Bell's Depot, November 19; county generally. (66) E. J. READ, sr., Bell's Depot, March 22; lowlands of Black creek; uplands generally. (67) P. M. NEAL, Maury City, July 10; civil district No. 10, western part of county.

Gibson.—(68) J. M. SENTER, Trenton, July 15; county generally. (69) J. W. HAYS, Trenton, June 24; Cane creek lands, south of Trenton. (70) L. P. MCMURRY, Trenton, July; southwestern part of county, Big creek and Forked Deer lands. (71) ZACK BRYANT, sr., Milan, April 3; southeastern part of county, waters of the Obion and Forked Deer rivers.

Weakley.—(72) E. D. TANSIL, Sharon, May 1; southwestern part of county, lands of Mud creek and Obion river. (73) A. M. SMYTH, Gleason, April 20; southern part of county, lands of Spring creek and Obion river. (74) G. W. ISBELL, Gardner's Station, April 24; northwest from Dresden. (75) S. C. CRAVENS, Gardner's Station, April 22; northwest from Dresden. (76) J. C. LIPSCOMB, Greenfield, April 17; southwestern part of county, lands of the three forks of the Obion river. (77) GILBERT PATTERSON, Greenfield, July; southwestern part of county. (78) T. D. MARTIN, Martin, April 3; northwest from Dresden.

Henry.—(79) W. P. SMALLWOOD, Paris, July 5; county generally. (80) S. C. DOBBINS, Paris, April 19; south and southwest parts of county. (81) J. F. CAVITT, Paris, January 2; northwestern and southwestern parts of county, waters of the forks of the Obion river. (82) B. D. BOWDEN, Cottage Grove, July 23; county generally. (83) J. R. WILLIAMS, Henry Station, April 22; county generally. (84) Dr. W. S. FRYER, Paris, July 3; county generally. (85) A. ROBINS, Manlyville, April 26; waters of Gin branch and Big Sandy river, southeast from Paris. (86) D. L. WILLETT, Springville, July 15; civil districts Nos. 7 and 24, southeastern part of county.

Carroll.—(87) E. T. BOHANNON, Trezevant, April 20; western part of county, waters of Lick creek and Obion river. (88) B. T. HILSMAN, Trezevant, April 20; western part of county, waters of Reedy creek and Obion river. (89) A. R. CARNS, Carnsville, July; northern part of county, waters of Crooked creek. (90) T. N. LANKFORD, McKenzie, April 1; northwestern part of county, Obion uplands. (91) J. F. SLOAN, Milan, Gibson county, August 4; northwestern part of county, Obion lands. (92) J. H. JORDAN, Hollow Rock, June 18; northeastern part of county, lands of Hollow Rock creek. (93) WILLIAM JOHNSON, Clarksburg, July 1; southeastern part of county, Roane's creek and Big Sandy lands.

Henderson.—(94) W. C. TRICE, Henderson, Madison county, April 8; southwestern part of county, uplands of Forked Deer river. (95) E. W. CUNNINGHAM, Lexington, March 1; county generally. (96) JOHN PEARSON, Lexington, June 3; eastern part of county, Beech river lands. (97) N. C. ESSARY, Lone Elm, July; county generally. (98) C. M. DAVIS, Lone Elm, June 22; eastern part of county, Beech river lands. (99) T. M. STUBBLEFIELD, Shady Hill, July 10; southeast from Lexington. (100) R. J. DYER, Shady Hill, April 1; civil district No. 14, southeast from Lexington. (101) F. G. ROGERS, Scott's Hill, April 20; southeast corner of county, lands of Cane and Flat creeks and Beech river. (102) A. H. FARNSWORTH, Centre Point, May 1; civil districts Nos. 12 and 13, southeastern part of county. (103) P. B. MCNATT, Centre Point, March 4; southeastern part of county, Middleton creek lands.

McNairy.—(104) B. M. TILLMAN, Henderson, Madison county, January 8; civil districts Nos. 4 and 14, northwestern part of county, (105) A. W. STOVALL, Bethel Springs, June 29; county generally, waters of the Hatchie and Tennessee rivers. (106) J. H. ROWSEY, McNairy Station, July; northwest from Purdy, waters of the Hatchie. (107) R. D. ANDERSON, Falcon, April 10; southwest from Purdy, Oxford's creek, waters of the Hatchie river. (108) SYDNEY PLUNK, Tinsley, and F. E. MILLER, Sweet Lips, April 13; northern part of county, waters of the Forked Deer. (109) J. G. COMBS, Purdy, April 15; parts of districts Nos. 15, 7, 10, and 11, east of Purdy. (110) J. H. MEEKS, Stantonville, April 9; civil districts Nos. 5, 9, and 10, southeastern part of county; also much of eastern part. (111) W. J. SUTTON, Corinth, Mississippi, April 15; southeastern part of county, Owl creek lands.

WESTERN VALLEY OF THE TENNESSEE RIVER.

Benton.—(112) A. C. PRESSON, Camden, July; county generally. (113) P. M. MELTON, Big Sandy, April 9; northern part of county. (114) J. H. BRIDGES, Camden, April 5; middle of county, Cypress creek, waters of the Tennessee. (115) A. E. SWINDLE, Camden, March 20; lands on Tennessee river side. (116) W. F. MAIDEN, Camden, April 15; lands on Tennessee river side.

Decatur.—(117) J. H. PEARCY, Decaturville, June 20; lands of Turkey creek, west of Decaturville. (118) D. M. SCOTT, Decaturville, April 16; middle and southern parts of county. (119) JOHN MCMILLAN, Decaturville, January 22; county generally. (120) R. T. SIMMONS, Swallow Bluff, June 24; southern part of county. (121) W. R. and R. J. AKIN, Swallow Bluff, April 20; southern part of county, Stewman's creek lands. (122) J. G. YARBOROUGH, Peter's Landing, Perry county, July 6; civil district No. 2, southeastern part of county, along the Tennessee. (123) W. H. BOGGAN, Bath Springs, June 23; southern part of county, Turnbow's creek lands. (124) J. F. AKIN, Bath Springs, April 20; southern part of county, Turnbow's creek lands. (125) L. D. CRAWLEY, Peter's Landing, Perry county, April 7; south of Decaturville, White's creek lands.

Hardin.—(126) J. C. MITCHELL, Saltillo, June 10; northwestern part of county. (127) J. W. IRWIN, Savannah, June 25; civil district No. 4, central part of county.

Humphreys.—(128) W. J. WHITE, Fowler's Landing, July 20; southern part of county. (129) W. D. KING, Buffalo, July 20; southern part of county.

THE HIGHLANDS, OR HIGHLAND RIM OF MIDDLE TENNESSEE.

Hickman.—(130) J. M. GRAHAM, Pine Wood, July 30; lands of Piney and Duck rivers.

Lawrence.—(131) N. M. HOLLIS, West Point, July 20; southwestern part of county.

Franklin.—(132) J. F. ANDERSON, Anderson, January 26; civil district No. 12, southeastern corner of county; Crow creek valley.

CENTRAL BASIN OF MIDDLE TENNESSEE.

Giles.—(133) D. T. REYNOLDS, Buford, February 12; northern part of county, waters of Richland creek. (134) T. O. ABERNATHY, Buford, April 1; northern part of county, waters of Richland creek. (135) J. E. ABERNATHY, Buford, April 10; civil district No. 13, northern part of county; waters of Big creek. (136) NEWTON WHITE, Pulaski, February 26; waters of Richland creek. (137) JIM RIVERS, Pulaski, February 10; waters of Richland creek. (138) J. N. PATTESON, Pulaski, February 10; waters of Richland creek and Elk river. (139) W. RIVERS, Pulaski, February 15; waters of Richland creek and Elk river. (140) J. J. LINDSAY, Pulaski, March 10; waters of Egnew's creek, west of Pulaski. (141) J. G. MASON, Prospect, February 13; civil district No. 2, southern part of county. (142) J. S. EDMONDSON, Bethel, January 21; southern part of county, Jenkin's creek lands. (143) J. F. PARKER, Bethel, February 14; civil districts Nos. 3 and 4, southwestern part of county. (144) J. K. P. BLACKBURN, Brick Church, March 27; eastern part of county, lands of Richland and Bradshaw creeks. (145) SAMUEL YOKLEY, Campbellsville, April 12; northwestern part of county, lands of Big creek. (146) T. B. WADE, Wales Station, February 4; lands of Pigeon Roost and Richland creeks, north of Pulaski.

Lincoln.—(147) M. D. HAMPTON, Fayetteville, June 28; lands of Elk river. (148) J. D. TILLMAN, Fayetteville, February 4; lands of Elk river.

Moore.—(149) E. Y. SALMON and others, Lynchburg, July 23; lands of Mulberry creek and Elk river.

Bedford.—(150) B. F. RANSOM, Fosterville, July 26; civil districts Nos. 5, 6, 8, and 11, northwestern part of county. (151) W. R. RANSOM, Shelbyville, July 19; lands of Fall creek, northwestern part of county. (152) Rev. M. F. THOMPSON, Unionville, July 22; civil district No. 11, northwestern part of county. (153) B. F. JARRELL, Rover, July 17; civil district No. 10, northwestern corner of county. (154) R. C. ALLISON, Rover, July 6; civil district No. 10, northwestern corner of county.

Marshall.—(155) J. F. BRITTAIN, Holt's Corners, February 10; northeastern part of county, Spring creek lands. (156) J. B. EZELL, Chapel Hill, July 1; Spring creek and Duck river lands, northeastern part of county. (157) W. B. GLENN, Chapel Hill, July 3; civil district No. 8, northeastern corner of county.

Maury.—(158) L. E. POLK, Columbia, July 10; civil district No. 11, southwestern part of county. (159) D. F. WATKINS, Columbia, February 4; western part of county, Big Bigby lands. (160) LEON FRIERSON, Columbia, February 14; civil districts Nos. 13 and 14, western part of county; Big Bigby lands. (161) J. W. FRIERSON, Columbia, February 14; civil districts Nos. 13 and 14. (162) J. B. WILKES, Culleoka, February 10; civil district No. 6, Fountain creek lands; southeastern part of county. (163) W. O. GORDON Dark's Mills, March 22; lands of Carter's creek, north of Columbia.

Williamson.—(164) BROADWELL BROS., Franklin, May 10; civil district No. 8, north of Franklin; lands of Big Harpeth. (165) W. L. JOHNSON, Franklin, February 12; lands of Big Harpeth. (166) J. S. CLAYBROOKE, Triune, February 10; civil district No. 18, eastern part of county; lands of Wilson's creek and Harpeth river. (167) Dr. H. B. HYDE, Triune, January 25; lands of Wilson's creek and Harpeth river. (168) SAMUEL PERKINS, Triune, July 18; civil district No. 18, lands of Wilson's, Nelson's, and Arrington creeks. (169) S. A. POINTER, Thompson's Station, February 20; lands of Aenon and Harpeth creeks, and of Duck and Big Harpeth rivers. (170) T. F. P. ALLISON, College Grove, July; civil district No. 21, southeastern part of county.

Rutherford.—(171) ROBERT BRUCE, Murfreesborough, May 15; waters of Stone's river. (172) C. F. VANDERFORD, Florence Station, February 27; civil district No. 6, northwest from Murfreesborough. (173) Dr. R. B. HARRIS, Jefferson, February 29; northwestern part of county, Stewart's creek lands. (174) W. N. MASON, La Vergne, February; northwestern part of county, Stewart's and Overall creek lands. (175) A. M. MCELROY, Fosterville, February 7; county generally. (176) W. S. BATTEN, Fosterville, February 6; southern part of county, lands of west fork of Stone's river. (177) J. W. SMITH, Smyrna, February 9; northwestern part of county, lands of Stewart's creek and of Stone's river. (178) A. H. SANDERS, Smyrna, February 5; Stone's river lands. (179) J. S. GOOCH, Smyrna, February 13; lands of Stewart's creek and Stone's river. (180) Dr. J. W. DAVIS, Smyrna, February 13; lands of Stewart's creek and Stone's river. (181) D. M. NELSON, Smyrna, February 10; lands of Stewart's creek and Stone's river.

Davidson.—(182) W. WEAVER, Edgefield Junction, June 28; northern part of county, lands of Cumberland river. (183) J. M. TURNER, Edgefield Junction, February 6; northern part of county, lands of Cumberland river. (184) W. A. DONELSON, Hermitage, July 13; northeastern part of county. (185) PHILIP EARHEART, Hermitage, February 2; northeastern part of county, Stoner's creek lands. (186) W. S. DONELSON, Hermitage, June 28; northeastern part of county, Cumberland river lands. (187) B. GRAY, La Vergne, Rutherford county, February 20; civil district No. 6, southeastern corner of county. (188) M. M. LEEK, Donelson, July; east of Nashville, Mill creek lands.

Wilson.—(189) E. H. THORNTON, Gladeville, June 26; southwestern part of county. (190) TURNER VAUGHAN, Laguardo, June; lands of Spencer's creek and Cumberland river, northwestern part of county. (191) W. C. DAVIS, Laguardo, July 8; lands of Spencer's creek and Cumberland river, northwestern part of county.

Sumner.—(192) J. G. MARTIN, Hendersonville, July 9; southwestern part of county; Drake's creek and Cumberland river lands. (193) HARRY SMITH, Hendersonville, June 29; southwestern part of county; Drake's creek and Cumberland river lands. (194) S. R. DOXEY, Hendersonville, January 24; civil district No. 5; Drake's creek and Cumberland river lands.

VALLEY OF EAST TENNESSEE.

Hamilton.—(195) J. M. ELLIS, Chickamauga, June 24; southeastern corner of county.

Polk.—(196) ERLY BOYD, Benton, September 2; lands of Conasauga creek and of the Oconee and Hiawassee rivers, western part of county.

OTHER CORRESPONDENTS.

Grundy.—R. S. CLARK, Pelham, March 15.

James.—J. A. GREEN, Ooltewah, July 1.

Macon.—M. F. WEST, Walnut Shade, January 30.

SUMMARY OF ANSWERS TO SCHEDULE QUESTIONS.

[In the following pages the numbers placed before the county names are for reference to the table of correspondents.]

TILLAGE, IMPROVEMENT, ETC.

1. Usual depth of tillage (measured on land-side of furrow): What draft employed in breaking up?

MISSISSIPPI BOTTOM: From 4 to 6 inches, and usually with two mules or horses.

PLATEAU SLOPE OF WEST TENNESSEE: 3 or 4 and sometimes, though rarely, 6 and 8 inches; usually with one mule or horse. (51) *Haywood:* "Our freedmen, if left to themselves, will not go deeper than 1½ to 2 inches, while good farmers plow from 5 to 6 inches deep."

In *Gibson*, *Weakley*, and *Henry* counties the depth is 4 to 6 inches with double teams.

In the valley of the Tennessee, the Central Basin, and East Tennessee regions the usual depth is 4 to 8 inches, with double teams.

2. Is subsoiling practiced? If so, with what implements, and with what results?

To a very limited extent throughout the state. The implements used are Blount's sulkies, Hughes', Avery's, Oliver's, and Dunn's plows; Brinley's and Murfee's subsoil plows. In many counties a bull-tongue is made to follow immediately behind a turn-plow. A majority give the results as good. (93) *Carroll:* Improves the yield the first year, but after that is of no benefit. (25) *Tipton:* No improvement the first year, but after that is beneficial. (45) *Haywood:* "When the land is subsoiled the clay retains the moisture only; no food for the plant. When the soil is turned under deeply the moisture, in a dry season, will draw the roots of the plant to the bottom, where they find food also." (52) *Haywood:* Best for corn and cotton. (59) *Madison:* Especially good on old and worn-out land. (62) *Madison:* Diminishes the washing, increases the production, and lessens the effect of drought. (66) *Williamson:* Also increases the product in all seasons. (168) *Williamson:* Decided benefit if done in the fall; if in the spring, first crop is not so good.

3. Is fall plowing practiced? With what results?

It is practiced to some extent throughout the state, chiefly on corn, wheat, or other cereal lands, or after a pasturing season. The picking season of cotton crops usually closes too late to permit the practice.

The results are usually good, the lands generally being more easily tilled after fall plowing, and yield better crops.

(7) *Lake:* Insects killed and clay land pulverized. (14) *Lauderdale:* Fall-plowing does no good on land that has been cultivated, but on sod-land it is very beneficial. (33) *Shelby:* The lands are more liable to injury after washing rains, but otherwise results are good. (45) *Haywood:* In preparing the land for cotton after a wheat crop fall-plowing should be done; after corn or cotton it is not necessary. (91) *Carroll:* The results are not good; lands run together, and become hard and cloddy in spring. (134) *Giles:* It helps to protect lands against the washings of winter rains, and when green vegetable matter is turned under makes a better crop.

4. Is fallowing practiced? Is the land tilled while lying fallow, or only "turned out"? With what results in either case?

To a small extent in all of the counties, but is not general, the lands being "turned out" for rest when becoming exhausted. (11) *Lauderdale:* If the land is very rolling or hilly when left out it washes or gullies badly. If plowed deeply, turning under a green crop with all the litter, it does not wash. (26) *Tipton:* A few plow up; most turn out to weeds or clover; always beneficial, provided the land is protected from washing, and not tramped by stock. In clover the benefit is 100 per cent. (33) *Shelby:* Only by necessity when exhausted; is not tilled except it is sometimes sown in pease or planted in sweet potatoes without cultivation. To till without some crop to shade the soil is injurious; to "turn out" is of little benefit temporarily, and none permanently. (38) *Fayette:* Sometimes tilled, but never permanently turned out; the result is good when tilled, but better when turned out for twelve months; then subsoil and plant. (51) *Haywood:* Some sow pease, which, when done in July, are turned under in September; but more "turn out" than otherwise. To let land lie out and permit the weeds to mature is, in my opinion, a great folly. Thus to mature seed by the million, with the expectation of improvement, is, I think, nonsense. I have urged farmers to turn weeds under and plant pease, or, if nothing better, to turn weeds under when green. (60) *Madison:* Summer fallowing is usually followed with fine results. (67) *Crockett:* To till the land impoverishes the soil; to "turn out" restores it. (145) *Giles:* After lying in clover or grasses for four or five years a good crop is expected. (169) *Williamson:* "Turning out" improves land if level and not tramped by stock; if rolling, it is injured more by washing than benefited by rest. (188) *Davidson:* Only turned out for persimmon orchards; good persimmons, fat opossums, and happy negroes.

5. Is rotation of crops practiced? If so, of how many years' course, in what order of crops, and with what results?

Rotation is practiced quite generally throughout the state, and especially on farms where but little cotton is raised. Cotton is frequently planted for years in succession before being relieved by other crops. There is, as a rule, no regular order of succession. Corn usually is planted after cotton, and often followed in turn by small grain and clover, sometimes pease. Results are always

excellent. The following extracts are given from reports: (4) *Lake:* Corn usually three to five years, cotton four to five years, wheat two to three years, clover two years. Results, increased production of 20 to 33 per cent. (11) *Lauderdale:* Cotton is usually succeeded the next year by corn, wheat, or oats, and cotton again the following year. (26) *Tipton:* Generally corn follows cotton, and *vice versa;* cotton on wheat stubble is the rule, and is highly beneficial where the land is fed by clover, pease, etc. Corn, cotton, and wheat rotated will impoverish the land. (45) *Haywood:* Cotton should not be planted the first year after clover; a crop of pease is a fine preparation for cotton. We find it best to rotate every year. (50) *Haywood:* Cotton is a great exhauster, and by rotation we save our lands and make better crops. (51) *Haywood:* Cotton, corn, wheat, and clover, with a mixture of herd's-grass and orchard grass, and let lie, including the wheat year, three years. Best results. I can then haul out manure in July, August, and September, and spread on the grass all the winter. Grass protects the manure in warm weather from the burning sun, and gives a firm track for the wagon in muddy winter weather. (84) *Henry:* Alternate years, corn followed by wheat, cotton by wheat, and then corn; beneficial. (115) *Benton:* In planting cotton longer than two years on the same soil it don't open as well, neither does the lint grow so long. (120) *Decatur:* We sow oats and clover when the lands get too poor to make 500 pounds of seed-cotton. (135) *Giles:* Corn after clover, and sometimes wheat after clover; corn after wheat, and then allow to stand two years for grazing or mowing; land is kept in good condition by this rotation. Cotton-planters generally practice wheat rotation. (141) *Giles:* When cleared, corn is planted for three years, afterward cotton for four or six years, then small grain. (144) *Giles:* Sometimes the same crop is planted for ten years without change. (169) *Williamson:* Cotton, then wheat, then corn; then in wheat or oats, or clover, and then back into wheat or cotton. Land makes larger yields and improves daily.

6. What fertilizers or other direct means of improving the soil are used by you, or in your region? With what results? Is green-manuring practiced? With what results?

Commercial fertilizers are very rarely used in the state. Barn-yard and stable manure, or composts with these and cotton-seed, leaves, etc., comprise the fertilizers applied to lands, and are generally in use to their full extent in all of the counties. Land plaster also is frequently applied to clover lands, and sometimes when cotton is planted. (3) *Lake:* Only knew of one man hauling out manure from his barn, which he did to banish fleas. Our lands are too rich for fertilizers, but they would pay well on black land. (19) *Dyer:* When used, we make one-third more cotton. (26) *Tipton:* Sheep penned on poor spots. (34) *Obion:* Stable manures usually hauled out and spread broadcast in the spring; increased production in proportion to amount used. Most of the cotton-seed in this county is fed to cattle and sheep through the winter and returned to the soil in the form of manure, especially in the uplands. The bottom lands, being rich, are seldom fertilized, though when done they have bountifully repaid the cost with an increased yield and earlier maturity, and with a better fiber. (51) *Haywood:* Put all the old leaves, straw, corn-stalks, etc., into my barn-yard to let it absorb all the liquids possible, and when rotted haul out at leisure times. Scattered on poor clover land, bare spots, makes it better than the best. (57) *Madison:* Cotton-seed is one of the best fertilizers; its quick action as plant-food and its light weight to handle makes it preferable to anything else. All we need is something to kill the germ or grind the seed into meal while in the sound state, the meal, hulls and all, to be applied. It is thought by our best farmers that this would increase the crop 50 per cent. and improve the land every year. I think the seed is injured by heating or throwing into pens to rot. The meal from the oil-mills has double the strength. Very good results. (152) *Bedford:* The usual practice here is to plant small patches, from 1 to 5 acres, and manure well with barn-yard manure. By this, 1,200, 1,500, and sometimes 1,800 pounds of seed-cotton per acre are raised. (169) *Williamson:* "I use Virginia plaster in great quantities, and with very satisfactory results. The best method is to soak the seed in water and then roll them well in plaster before planting. Make as much plaster stick on as possible. Treated in this way, the seed come up sooner and grow off more rapidly. The bugs, so troublesome on young cotton, seem to leave the plants raised this way earlier. The above is the most important application of plaster, yet it ought to be sowed on in addition after the cotton is thinned to a stand and when the dew is on the leaf. I recommend the thorough trial of plastering in this way. The benefits resulting are not as apparent in wet weather as in dry. The plaster adds 50 per cent. to clover and 33⅓ per cent. to cotton.

GREEN-MANURING is practiced to quite an extent in all of the counties; with pease and clover in all of the regions except the Central Basin, where clover is most popular. Results always excellent.

(11) *Lauderdale:* We regard red clover as the best fertilizer we have on a large scale. (45) *Haywood:* One good crop of clover restores the land almost to its original state. The cheapest and most certain way to improve our land is with pease when it is too thin for clover; yet when a stand of clover can be obtained by the use of land plaster, the land can be made in a few years as good or better than ever and pay in the meantime as a pasturage. (62) *Madison:* Soil is made deeper, lighter, and more easy to till. (160) *Maury:* With clover generally; pease are becoming popular as a fertilizer, and are sown more and more every year. All lands produce better after them. (169) *Williamson:* With clover, the land adds 33 to 50 per cent. to the cotton yield.

7. How is cotton-seed disposed of? If sold, on what terms, or at what price?

It is largely sold to the oil-mills of Memphis, Jackson, and Nashville, except in the counties of the Highland Rim, western valley of the Tennessee, and valley of East Tennessee, prices being an average of about 10 cents per bushel, or $7 to $10 per ton. The seed is also largely used for fertilizers, and for feed to cattle and sheep during winter months.

(30) *Shelby:* All sold to oil-mills, which pay to the gins of Memphis, and within a radius of 5 miles, $10 50 per ton; to others, $9 per ton. (33) *Shelby:* Price is fixed by combination of oil-factories, with a forfeit of $100 for any one paying more than the agreed price. (51, 52) *Madison:* Good farmers rot them and spread them on the land; negroes sell all they can and beg seed the next spring for planting.

8. Is cottonseed-cake used with you for feed? Is it used for manure?

Except in the immediate neighborhood of the mills, the cake is scarcely used for any purpose. In the towns it is sometimes fed to cattle, mixed with other food. (29) *Shelby:* We have to pay $22 per ton, while New England farmers pay from $15 to $18 per ton. (33) *Shelby:* For feed, the price of the meal is too high. Near Memphis it is used in market gardens for manure. (42) *Hardeman:* For milch cows, mixed with bran; for dry cows it is fed alone. As manure for any crops. (70) *Gibson:* For feeding cattle, only mixed with wheat, bran, or corn-meal. (109) *McNairy:* Just being introduced; too rich for feed alone; as manure for vegetables, not for cotton. (166) *Williamson:* By dairymen for increase of milk and butter; also used to fatten beeves. (192) *Wilson:* To some extent as manure.

PLANTING AND CULTIVATION OF COTTON.

9. What preparation is usually given to cotton land before bedding up?

Fall plowing is very seldom done, except on stubble fields. If the land was in cotton the previous year, it is almost the universal practice to simply "bed up" between the former cotton rows, the old stalks being knocked down and plowed under.

(29) *Shelby:* Cotton is never picked out in time for fall plowing. (50) *Haywood:* Listing is done as early in the spring as possible; that is, throw two furrows up, let it stand until time for planting, when "bedding up" is done. (51) *Haywood:* Fall or winter plowing is pursued by good farmers; spring plowing by those who are always in a hurry, and who do everything out of time. (107) *McNairy:* If the ground is rough, it is either broken broadcast or rebedded in spring. Shallow plowing is gaining favor among our farmers and is now almost universally adopted, no center furrow even being run for the bed. The plant, when young, does much better in ground that is well settled together than in loose soil. (151) *Bedford:* A thorough breaking of the soil is made; best if done in the fall and bedded in spring just before planting.

10. Do you plant in ridges? How far apart? What is your usual planting time?

It is the universal custom to plant in ridges, the distance apart being from 3 to 4 feet, occasionally 2½ feet. This distance is greatest on bottom lands. Planting time is from the 10th of April to the 1st of May.

11. What variety do you prefer? How much seed is used per acre?

Seventeen varieties of seed are named by correspondents, the "green-seed" being the most popular. A number of answers are to the effect that after two or three years all the varieties become "green-seed". In many cases no special variety is chosen, the seed being mixed.

The following varieties are given by correspondents: Java Prolific, 16 correspondents; Sugar-loaf and Dixon, 9 each; Taylor, 8; Petit Gulf and Peeler, 7 each; Boyd Prolific, 5; Cluster, 4; Matagorda Silk, 3; Williams (N. C.) Prolific, 2. The following 1 each: Johnson, Schneider, Triple Twin, Golden Prolific, Arkansas Silk, Cheatham Prolific, and Tennessee Green-seed.

(9.) *Lauderdale:* The Taylor or Matagorda Silk is a good long staple. Dixon or any short staple lint and white seed is better than green-seed. (22) *Dyer:* Southern seed preferred here; after a few years' cultivation the seed becomes green and the lint shorter. (51) *Haywood:* Sugar-loaf degenerating into "green-seed" is the best where large crops are planted, as it will wait on the picker without falling out. Taylor cotton (Matagorda Silk?) has the longest staple and sells from ¼ to 1¼ cents more per pound. Java Prolific and Boyd's Extra Prolific grows in bunches, and if early would suit new land the best. (62) *Crockett:* No variety does well under four or five years' planting unless imported from the north of us. (158) *Marshall:* Our seasons are short, and many of the varieties that can be used south will not mature here; hence the Petit Gulf or regular green-seed is preferred. (175) *Rutherford:* The seed from the more southern states yield plants that run to weed and do not boll.

Two to four bushels are usually used per acre; sometimes a great deal more.

12. What implements do you use in planting? Are "cotton-seed planters" used in your region? What opinion is held of their efficacy or convenience?

Some farmers use plows to open the rows; the seed is planted by hand and covered with a harrow or board. Cotton-seed "planters" (largely home-made) are, however, mostly in use in all of the counties in the western part of the state where the lands are suitable, and to some extent in the central and eastern counties. The complaint in Lauderdale is that they cover the seed too shallow, and thus in dry weather it is very difficult to obtain a stand; otherwise they are highly esteemed in all of the counties by the majority of those who use them. (7) *Lake:* They are indispensable to large planters. (9) *Lauderdale:* Good, if properly managed, especially for early planting; they save much work, and put in the seed better than hand-planting. (34) *Obion:* Save seed, and save work in chopping out. (44) *Hardeman:* Save seed, put it in thin, and in a very straight drill, which is advantageous. (145) *Giles:* Convenient if the seed are rolled. (146) *Giles:* Good for intelligent labor, generally a nuisance. (153) *Bedford:* Are looked upon with suspicion. (194) *Sumner:* Convenient, but "stands" are bad.

13. How long, usually, before your seed comes up? At what stage of growth do you thin out your stand, and how far apart?

The time given varies very greatly, and is dependent on weather. In good seasons the plant makes its appearance in about a week or ten days; in wet weather earlier, and in dry sometimes as late as two or three weeks. When it has attained a growth of several inches, or has put out three or four leaves, it is thinned out, usually leaving several plants in a place at distances of from 15 or 18 inches on bottom lands and from 8 to 12 on the uplands. Afterward these plants are again thinned, leaving one or two in a hill, though many planters thin to this at the first. The first thinning is by many done as soon as possible after the crop is well up, so that a "scraper" can be used. (69) *Gibson:* When the land is damp, the plant appears in six days; when dry, in two weeks.

14. Is your cotton liable to suffer from "sore-shin"?

"Sore-shin" attacks the young plants to some extent throughout the state, and is attributed by planters to a number of causes, but mostly to cool and wet weather in the spring months and to injury by hoes.

(9) *Lauderdale:* When wet and cold, especially if the ground is not bedded up in time to let it settle before the plant comes up. (31) *Shelby:* In cold, wet weather if the dirt is thrown to it. (44) *Hardeman:* In very windy weather when very young. (160) *Maury:* On old cotton land. (169) *Williamson:* If worked too soon and not plowed immediately after the hoes.

15. What after-cultivation do you give, and with what implements?

(1) *Lake:* Scrape, hoe, and plow with a small shovel plow, and then run close to the cotton with double-shovel and sweep. (9) *Lauderdale:* Scrape, hoe, sweep; scrape again, hoe, and sweep, and sometimes scrape the third time if the grass is bad, and follow with hoe and sweep. Generally go over the crop three times. Many use the scraper only once, but I find scraping saves much hoeing, and is cheaper. (31) *Shelby:* In old land plow deep with shovel plows; in fresh land, shallow, with a 20-inch shovel plow. (43) *Hardeman:* Scrape and thin to a stand; then run two furrows with 16-inch shovel plow and hoe again; then two furrows with turning plow if wet or with 18-inch shovel plow if dry; plow again with turning plow and hoe again. (51) *Haywood:* Light harrowing and shallow culture toward the last; the side harrow is a great leading implement

in dry weather. Cotton is a plant that will wait upon the lazy producer and seemingly be as good in his fields as in others, but at gathering time the tale is told. (53) *Madison:* Small shovel *once;* large shovel, get further off and shallower as the plant grows larger. (57) *Madison:* I first scrape down and pass the hoes through it, leaving it in bunches, say four or five stalks in a bunch. Then I follow the hoes with a turning plow, and thus keep a good bed to the cotton. I think the cotton grows best in the good beds. Should I be pressed with the grass or any other trouble, this culture gives me the advantage. I can scrape it down again, and the hoes can cut it to a stand, leaving one or two stalks every 8 or 10 inches. Then follow the hoes again with the turning plow to keep the middles clean. Cotton should be thinned to a stand by the 20th of June, and should be in clean and good fix; otherwise we cannot expect it to pay us for our trouble. (167) *Williamson:* Bull-tongue and shovel plows; then Carey plows next the cotton; split the middles out with shovels or sweep, Carey or Avery plow. (169) *Williamson:* Continue to use the hoe and to plow with small turning plows or bull-tongues with small sweeps attached behind them. Close and deep plowing after the 15th of June is very injurious if dry. In cultivating cotton the land should be broken up early and deeply in the springs, say to a depth of 6 to 10 inches. (It is better to break in the fall and rebreak in the spring.) In bedding, the plows should be sharp and put in the ground as deeply as the teams can pull them. In giving the cotton the first plowing it is well enough to let the plow into the ground deeply, but after the 15th day of June deep plowing is injurious. After the 15th of July, and I might say perhaps after the 10th of July, deep plowing is ruinous, and the worse if done in dry weather. By using plaster freely both before and after planting and working the ground once in every twelve days, running further from the cotton each time and seeing that your laborers at the last plowing almost take their plows out of the ground, I will insure 1,000 pounds of cotton to the acre on all good land in Williamson, Maury, or Giles, providing the season is a fair one for cotton culture. (172) *Rutherford:* The scraper is first used for the double purpose of destroying young grass and weeds and to straighten and trim the row of plants to a thin line. Plants are "chopped" with the hoe to a stand. Subsequent cultivation with the plow, so done as to keep the bed and middles clear of grass and weeds and to promote vigorous "stocky" growth. (183) *Davidson:* With plows or shovels keep it hilled up so it will not fall down, and keep it chopped clean in the drill. It will depend upon the seasons how often it is worked.

16. What is the height usually attained by your cotton before blooming? When do you usually see the first blooms?

In the Mississippi bottom region plants usually reach a height of from 18 to 30 inches; throughout the rest of the state it varies greatly, even in the same counties, but is usually 12 to 18 inches, sometimes but 6, and sometimes 24 inches.

The earliest date given in which the first blooms appear is the 10th of June, in Madison county (62). In Lake, Lauderdale, and Dyer the last of June or 20th to 30th. Throughout the rest of the state, July 1 to July 10.

17. When do the bolls first open?

"Latter part of July:" (3) *Lake,* (29) *Shelby,* (73) *Weakley,* (142) *Giles,* and (190) *Wilson.*

"August 1 to 15:" (7) *Lake,* (9) *Lauderdale,* (21) *Dyer,* (38) *Shelby,* (44) *Hardeman,* (46) *Haywood,* (59) *Madison,* (82, 84) *Henry,* (93) *Carroll,* (95, 103) *Henderson,* (110) *McNairy,* (112) *Benton,* (119) *Decatur,* (127) *Hardin,* (133, 137) *Giles,* (151) *Bedford,* (162) *Maury,* (165) *Williamson,* (174, 176) *Rutherford, Hamilton,* and *Polk.*

In other counties, from the 15th of August to the 1st and 10th of September.

18. When do you begin your first picking? How many pickings do you usually make?

Picking begins as soon as there is enough cotton open to make a day's work (50 or 75 pounds); the usual time is from the 1st to the 10th or as late as the 15th of September, though in the western part of the state some picking is done a little earlier. (4, 7) *Lake:* 15th of August to 1st of September. (14) *Lauderdale* and (34) *Obion:* 20th and 25th of August. Two and three pickings are usually made, the crop being picked over as rapidly as possible, and as often as necessary to gather all the cotton. Sometimes the seasons are late, and only one picking is made.

19. Do you ordinarily pick all your cotton? At what date does picking usually close?

All of the cotton is very generally gathered throughout the state, excepting of course that which falls to the ground before the picker reaches it. Help is usually employed in gathering the crop, and is paid by the 100 pounds of seed-cotton. In the western part of the state picking usually closes about the 25th of December, though it is frequently continued to the 1st of February, and even March, when the crops are large. In the Highland Rim, the Central Basin, and East Tennessee regions it closes by the 25th of December, and sometimes earlier.

20. At what time do you expect the first "black frost"?

Usually about the 10th or 20th of October. Some reports give an earlier and some a much later date. (52) *Haywood:* The last of September. (6) *Lake:* Middle of November. (31) *Shelby:* Usually November 1, though I have had cotton killed in September. (54) *Madison:* December 1. (66) *Crockett:* 15th of November. (106) *McNairy:* Latter part of November. (131) *Lawrence:* Freezing weather November 1 to 10. (136, 138, 140) *Giles:* White frost 15th to 20th October. (159) *Maury:* November 15. (165) *Williamson:* November 20. (183) *Davidson:* Cotton and bolls killed October 15. (185) *Davidson:* About middle of September.

21. Do you pen your seed-cotton in the field, or gin as the picking progresses?

Both methods are practiced, according as the crop is large or small. Cotton is usually penned in the field if crops are large and sent to gin as fast as possible, the latter being kept running all the time. On small farms the seed-cotton is usually housed at home and sent to gin as soon as a bale is gathered. (33) *Shelby:* Never pen in field, as country stores would get much of it. (51) *Haywood:* Make rail pens and line the inside with boards, perpendicularly placed. In this way, with a good cover, the cotton is kept dry, and much labor and time are saved.

GINNING, BALING, AND SHIPPING.

22. What gin do you use? How many saws? What motive power? If draft animals, which mechanical "power" arrangement do you prefer? How much clean lint do you make in a day's run of 10 hours?

Gins of twenty-four different names or patents are mentioned by correspondents, as shown below. Number of saws vary from 40 to 80. Both steam-engines and draft animals are used as a motive power. With the latter the inclined tread-wheel is quite popular in some of the counties.

(20) *Dyer:* Prefer steam first, then inclined wheel, then lever power. (43) *Hardeman:* Old-fashioned gin-gearing, spur-wheel, and band-wheel. (51) *Haywood:* Gins of eighty saws are being used all over the county by men who do nothing but gin for the public. Steam gins are preferable, but farmers who have many mules are glad to have them at work. This ginning is hard on the mule. (134) *Giles:* The "Robinson Bevel Gearing" makes the lightest draft for the amount of speed given the gin. (135) *Giles:* The old-style large wooden driving-wheel with cast segments and cast pinion. (172) *Rutherford:* The sweep power, with 12-foot main driving-wheel, with band-wheel 6 to 8 feet diameter, driven by pinion from main wheel, gin-pulley usually 8 inches diameter.

CAPACITY OF GINS AS GIVEN BY CORRESPONDENTS.

PRATT'S GIN, mentioned in 18 counties:

	Pounds.
60 saws, by steam-engine	2,300 to 4,000
60 saws, by 4 horses or mules	1,800 to 2,000
50 saws, by steam-engine	2,500 to 3,300
50 saws, by 4 horses or mules	1,000 to 1,800
50 saws, by 6 horses or mules	2,000
50 saws, by tread-wheel	1,000 to 1,500
45 saws, by horse-power	1,500

CAROW GIN, mentioned in 15 counties:

80 saws, by 10 horse-power steam-engine	2,500 to 3,000
70 saws, by mules (draft-wheel)	800 to 1,000
60 saws, by steam-engine	2,750
60 saws, by 45 horse-power steam-engine	3,750
60 saws, by 6 or 8 mules on inclined wheel	1,000 to 1,500
50 saws, by 16 horse-power steam-engine	2,625

GULLETT GIN, mentioned in 14 counties:

80 saws, by steam-engine	3,200
60 saws, by 12 horse-power steam-engine	3,500
50 saws, by 16 horse-power steam-engine	2,625
50 saws, by 8 horse-power steam-engine	3,200
50 saws, by tread-wheel	1,200 to 1,500

BROWN'S GIN, mentioned in 10 counties:

80 saws, by steam-engine	4,000 to 6,000
60 saws, by tread-wheel	1,850
50 saws, by mules and tread-wheel	1,200 to 1,500
50 saws, by mules or horses	1,350 to 2,000
50 saws, by water-power	1,700 to 2,000
40 saws, by mules	900

EAGLE GIN, mentioned in 9 counties:

80 saws, by 20 horse-power steam-engine	4,000
50 saws, by 10 horse-power steam-engine	3,000
50 saws, by 4 mules	1,000 to 1,700
40 saws, by mules on inclined wheel	900

SMITH'S GIN, mentioned in 6 counties:

70 saws, by steam-engine	4,000 to 5,000
60 saws, by steam-engine	3,000
60 to 80 saws, by inclined wheel and mules	2,000
50 saws, by mules	1,500

HICK'S GIN, mentioned in 6 counties:

70 saws, by steam-engine	2,000 to 3,000
50 saws, by mules	1,500
45 saws, by mules	1,000

WINSHIP GIN, mentioned in 4 counties:

60 saws, by 12 horse-power steam-engine	3,750 to 5,000
50 to 60 saws, by inclined wheel and mules	1,500
40 saws, by steam-engine	1,850
40 saws, by mules	1,200

NEEDLE GIN, mentioned in 4 counties:

60 saws, by 12 horse-power steam-engine	7,000
50 to 60 saws, by horses or mules	1,500

ROBINSON GIN, mentioned in 4 counties:

50 to 60 saws, by horses or mules	1,500

NANCE GIN, mentioned in 3 counties:

60 saws, by inclined wheel and mules	1,150
55 saws, by mules	1,500

EMERY GIN, mentioned in 3 counties:

50 saws, by horses	1,200
45 saws, by horses (lever power)	1,500

STAR GIN, mentioned in 3 counties:

50 saws	1,500

MAGNOLIA GIN, mentioned in 2 counties:

80 saws, by steam	3,200

GEORGIA GIN, mentioned in 2 counties:

60 to 80 saws	2,000
50 saws	900 to 1,100

The following gins in 1 county each:

Kingsland, Fergerson & Co., 50 to 80 saws, by horse-power	2,000
Chafin (home-made), 50 saws, mules	1,500
Phœnix, 50 saws, 6 mules	1,700
Latham, 50 to 60 saws, mules	1,500
Webb, 50 saws, mules	1,500
Wilkerson, 50 saws, mules	1,500
Elliott (home-made), 60 saws, tread-wheel	1,500
Hall and Sattern's gins (capacity not given).	

23. How much seed-cotton, on an average, is required for a 475-pound bale of lint?

The estimate varies very greatly even in the same county, and is between 1,545 and 1,660, or even 1,780 pounds, without regard to regions. The number of pounds required is, as stated by one of the correspondents (16 Lauderdale), early, 2,140, late, 1,545, dependent upon the time that elapses between picking and ginning; the earlier the greater the weight.

Very few estimates are as low as 1,425, the general average being about 1,600 pounds.

24. What press do you use for baling? What press is generally used in your region? What is its capacity?

There are 25 patented iron-screw presses reported in the state, while in many of the counties the old style home-made wooden press is still in use. The capacity of the iron-screw presses with several men and one mule is from 10 to 15 bales per day. Some report Brooks' as much as 20 bales. The following list embraces those reported: Wilson press in 8 counties; Brooks' and

Scofield's presses in 7 counties each; Arrow and Reynolds' in 5 counties each; Finley and Cheek in 4 each; Deering in 3 counties; Southern Standard, Nesbit, Collins, and Fergerson presses in 2 each. The following in 1 county each: Caruthers, Crenshaw, McDermott, Reeder, Winship, Lewis, Russell, Rutherford county press, Spread Eagle, Shearer, Jackson, and Janney's. "The old wooden press is clumsy and slow;" with 2 men and 1 mule it will press about 4 bales per day. (51) *Haywood:* Reynolds' revolving press. There is no lifting of cotton in this press; it is rolled in by men and boys. It can't be used by steam as yet. With men, boys, and 1 mule it will make 1 bale every 45 minutes. Nesbit's press, by steam, will press a bale every 30 minutes. (175) *Rutherford:* With two horses or mules we can make a bale of 600 pounds with the old wooden-screw press. The box or hay press works by lever power, and 2 strong men can make a 500-pound bale. The patent iron-screw presses are superior to the others.

25. Do you use rope or iron ties for baling? If the latter, what fastening do you prefer? What kind of bagging is used in your region?

Iron ties are used exclusively in all of the counties, except Polk, in the valley of East Tennessee, where rope is reported. The fastening embraces three kinds, the arrow, the buckle, and the button or Beard tie, and are about equally preferred. Jute, hemp, and flax 2-pound bagging are used, the first two, and especially hemp, having the preference.

26. What weight do you aim to give your bales? Have transportation companies imposed any conditions in this respect?

A weight of 500 pounds is aimed at almost universally, freight being charged per bale regardless of weight. A requirement is made that each bale must be over 400 pounds; otherwise a deduction of $1 or more is made from its price by merchants. (37) *Fayette:* Bales under 350 pounds are not merchantable. Whether this regulation is laid down by railroad companies or boards of trade I do not know. (172) *Rutherford:* The railroad companies make no distinction as to weight of bales, the sizes being nearly the same, whether light or heavy. About 24 bales of uncompressed cotton will fill an average car; the freight charges are therefore based upon bulk rather than upon weight.

DISEASES, INSECT ENEMIES, ETC.

27. By what accidents of weather, diseases, or insect pests, is your cotton crop most liable to be injured? At what dates do they usually make their appearance?

Caterpillars have only appeared, though very rarely, in the counties of Lauderdale, Tipton, Shelby, Fayette, Hardeman, Haywood, Madison, Weakley, Henry, Franklin, Giles, Lincoln, Maury, Williamson, Rutherford, Davidson, Wilson, and Sumner. They are by some considered a benefit to the cotton crop. The *boll-worm* has sometimes appeared in these counties, and also in Carroll, McNairy, Benton, Decatur, and Moore. The *cut-worm* in a few counties in the western part of the state appears early in May and does some damage. *Lice* (*Aphides*) are quite a common enemy to the plant in May, except in East Tennessee, where no mention is made of them.

The diseases incident to the weather, such as shedding, rot of bolls, rust, blight, etc., are prevalent in all of the counties to a greater or less degree and in summer months. (9) *Lauderdale:* The caterpillar has never come early enough to do any serious damage, but sometimes does good by stripping leaves off. Lice in May and June do much damage by retarding growth and sometimes kills young plants. (51) *Haywood:* In cold, rainy, sunless weather cotton suffers greatly, first, from a general shrinkage of the stalk, sore-shin, and black leaf, and then death, or a shock from which it very slowly recovers. Then lice prey upon it until the 25th of June, but if the weather is hot no injury is done.

28. To what cause is the trouble attributed by your farmers?

The various diseases are commonly attributed to extreme changes of weather. The following extracts are made: (49, 50) *Haywood: Rust* is considered an insect originating from old stumps and decaying wood, and appears most frequently in new ground. (51) *Haywood:* Blight or blasting rust, as some call it, often in dry spells of weather late in August. Rust and shedding of bolls are among our great evils. What causes rust I do not think is well known; what it does we know well. It is an insect, like the rust of the raspberry leaves, wheat, oats, etc. It comes generally on new land, and mostly around hickory stumps, but often not a stump of any kind is visible. Rain often arrests it. I tried salt last year, throwing it over the stalks and suffering much of it to settle around the stem at the ground. My field of 15 acres which was attacked was saved, but I cannot say the salt did it, for a rain came in a few days, and this might have arrested it. Rust is not to be confounded with what is termed blasting, which is a species of rust caused by extreme dry weather, and will spread over a field in a day or two; this is worse on old land than on new. As to the shedding of bolls, if even one-third of those that fall could be made to stick and do the work nature seems to have intended for them we could raise a bale of cotton (500 pounds) every year to the acre. To prevent shedding, the best plan, I think, to be pursued is to subsoil the row over which the cotton stalks grow; that is, after fallowing deeply, say in February or March, when the rows are to be laid off, run in this furrow a subsoil plow, then bed on this. The cotton plant, having a long tap-root, can get down easily to moisture, and if any good fertilizer suitable for cotton is there this tap-root certainly would have plant-food far removed from the blasting influence of a drought. I have tried this on a small scale, and the cotton raised did not shed the bolls half so much. (110) *McNairy:* Red rust is more prevalent during very dry weather; the black rust is caused by excessively wet weather, and both are thought to be parasitic. (121) *Decatur:* Black rust on wet land to wet weather; on uplands, the red rust to dry weather. (133) *Giles:* Blight is caused by applying the soil to the plant too freely in dry weather and rain following in less than five days; shedding is caused by deep culture and want of moisture; rust is caused by excess of lime in soil and deep culture, followed by dry weather, checking the growth suddenly, and to the peculiarity of season and improper culture.

29. What efforts have been made to obviate it? With what success? Is Paris green used as a remedy against the caterpillar?

As a rule no efforts have been made against insects or diseases; Paris green has not been used. (11) *Lauderdale:* None that I know of, except to burn the old stumps and trees in the field where it usually prevails; it almost always begins near one of these, and is generally recognized as an insect. It is hard to tell as to success, as rust may be very injurious to the crop one season and may not appear even in the same field the next. (14) *Lauderdale:* I try to obviate the rust by plowing with a light plow, so as not to disturb the roots of the cotton. I think it is benefited, but don't know to what extent. (26) *Tipton:* None, except rotation of crops and turning under vegetable matter. A few claim that lime broadcast prevents rust

and blight. Some farmers of good sense ascribe rust to the presence or near vicinity of the poke-root. Rotation appears to relieve rust. We have never been troubled with worms. A variety of caterpillar occasionally strips off all the leaves the last of August. This stripping has always proved to be of service by hastening the maturity and opening. (42) *Hardeman:* Shedding in dry weather stopped to some extent by continued plowing; rust, pull up first stalks and burn or bury; this often stops it from spreading. (44) *Hardeman:* We have begun to practice rotation and putting our land in better condition. Marked improvement. Paris green not used. It is said to be a remedy, but is too poisonous to be handled. Let the birds live and they go as far in destroying the caterpillar as nostrums now used. (51) *Haywood:* Some have burned up every hickory stump and tree in the field, but shallow culture with broad shovel and side harrow, and never plowing when the land is wet, has been our best protection. (57) *Madison:* None but to pull up the plant affected and carry it out of the field. I have stopped the red rust in that way in its early stage. The black rust seems to spread so fast that it is useless to try to stop it. (107) *McNairy:* Have known common salt sown when the plant was wet with rain or dew, which was thought to check it. (108) *McNairy:* Success is attained only on well drained and well-cultivated lands. (120) *Decatur:* Light harrowing is good after the plowing is done in dry weather to prevent the droppings. One furrow in the middle is good to keep it from baking if likely to be too wet. (169) *Williamson:* Plaster is used to drive off the bugs; running the plow far off and plowing shallow will prevent red rust; change of weather from wet to dry alone will stop black rust and August shedding. Good success.

30. Is rust or blight prevalent chiefly on heavy or ill-drained soils? Do they prevail chiefly in wet or dry, cool or hot seasons? On which soil described by you are they most common?

Blight is prevalent chiefly on ill-drained soils, in extremes of weather, and on either heavy or light soils.

Rust appears, apparently regardless of weather or character of lands, as seen in some of the following replies:

(9) *Lauderdale:* Blight does not appear uniformly on heavy and ill-drained soils; in some cases land that had been formerly planted in corn escaped blight, when dry cotton land in the same field suffered. Blight is more frequent on wet lands and bottoms. (12) *Lauderdale:* Rust on high land, blight on low; prevails in extremes of weather. Rust on mulatto and blight on black sandy land. (14) *Lauderdale:* Light soils suffer more from rust, new land more than old. Wet, damp weather for blight; cool, dry seasons for rust. The blight on heavy soil, and the rust on new or that recently put in cultivation. (23) *Tipton:* Very seldom on old lands; always in violent changes of temperature. (31) *Shelby:* In all extremes of weather; red rust is more common on light soils in hot, dry weather; black rust on heavy soil in cool, wet weather. (37) *Fayette:* Eccentric and sporadic, but this law of generation don't seem connected much with soils. (49, 51) *Haywood:* It seems worse on loose, black, friable soils. Dry and hot weather. On a black, porous, mellow, friable soil rust seems to do its worst. Hickory land is thought to be more subject to it than other classes of timbered land, yet I have seen it on purely poplar land. (57, 59) *Madison:* Hot and dry, often too much wet weather. On uplands, first appearing around or near stumps or dead trees and near the fence, especially if poke-stalks grow about them. (104) *McNairy:* On uplands as bad, if not worse, than on bottoms. The kind of season does not seem to affect it. No soil is exempt; bottom lands are cleanest, and fresh uplands most subject to it. (107) *McNairy:* Buckshot land does not have rust. Loose hazel soil is most subject, and in cool seasons. Rust does not damage cotton on wet, heavy soils. (109) *McNairy:* Wet, hot seasons. Red rust on very loose, loamy soil, with gray subsoil containing black, angular gravel; black rust on yellow-gray soil; subsoil same as above. (110) *McNairy:* Red rust is prevalent on well-drained land; black rust on any. Red rust in dry, black rust in wet seasons. On our black sandy loam, hazel-nut and poplar lands we have red rust if the weather is very dry; the black rust is common to any soil. (122) *Decatur:* Light soils. Dry, hot seasons; some spots of black land in wet seasons on dry, high sandy soils. Rust is unknown on clay soils in this vicinity. (146 and others) *Giles:* On black soils, extreme wet or dry weather. Black rust on black soil, red rust on any soil, by sudden checking of growth, caused by deep culture or dry weather. (158) *Marshall:* Blight is very rare here; is produced by wet weather; rust by dry weather; gravelly lands most subject to it. (160) *Williamson:* Red rust is worst on poor land; black rust in wet weather, on low, rich bottom land; red rust in dry weather on poor upland. (190) *Wilson:* Heavy soils, wet and cool weather, on low and wet lands. Wood-ashes and lime greatly counteract this disease in the cotton-plant. (194) *Sumner:* Dark loam land, known as blue-grass land, is most liable to rust.

LABOR AND SYSTEM OF FARMING.

31. What is the average size of farms or plantations in your region? Is the prevalent practice "mixed farming" or "planting"?

In the Mississippi river bottom region there are many small farms of from 10 to 50 acres. Other farms contain 100 to 300 acres, and some as much as 800 to 1,000 and 1,500 acres. In the counties of the adjoining region of West Tennessee the size of farms vary very greatly, from 50, 100, to 500 acres, and more in a very few instances: (38, 39) *Fayette:* 640 to 3,000. (51) *Haywood:* 500 to 2,000. (104) *McNairy:* 100 to 1,000. In the western valley of the Tennessee the farms contain mostly 100 acres and less, a larger number seldom being reported, and then in no instance more than 500. In the Highland Rim region 100, 150, to 200 acres are given as averages. In the Central Basin the same variation occurs as in West Tennessee, the greater number of average estimates falling below 500 acres, and mostly from 100 to 300. The following extreme sizes are given, but not as an average of the county: (137, 138) *Giles:* 1,000 and 1,800 acres. (155, 156) *Marshall:* 1,000 acres. (167, 169, 171) *Williamson:* 800 and 2,000 acres. (178) *Rutherford:* 1,000 acres. (185) *Davidson:* 1,100 acres. (192) *Sumner:* 3,000 acres. In the valley of East Tennessee the average of 200 acres is given.

Mixed farming is the prevalent practice throughout the state, though some planting is done in Lake, Lauderdale, Tipton, Fayette, Hardeman, Haywood, Madison, and McNairy.

32. Are supplies raised at home or imported, and if the latter, where from? Is the tendency toward the raising of home supplies increasing or decreasing?

In all of the counties but Shelby, and largely in Hardeman, the greater part of the supplies are raised at home, only a comparatively small portion being brought from Saint Louis or New Orleans. (30) *Shelby:* Very few are self-sustaining; most everything, from a pin to a steamboat, is brought from Memphis. (32) *Shelby:* Our good farmers raise their own; others raise cotton only, and buy supplies. (43) *Hardeman:* The greater part of the meat and all of the flour for laborers and landlord are imported from Saint Louis and Cairo.

All of the correspondents report the tendency toward raising supplies as increasing, or in some cases as stationary, except (45) *Haywood,* (99, 103) *Henderson,* (137) *Giles,* (184) *Davidson,* (33) *Shelby;* with whites, increasing; with negroes, decreasing.

33. Who are your laborers chiefly? whites, of what nationality? How are their wages paid—by the year, month, or day, and at what rates? When payable?

Mostly negroes in West Tennessee, while in the western valley of the Tennessee and regions eastward the whites predominate, among whom are very few foreigners, a few Swedes in Tipton, and Germans in Decatur. Wages are mostly paid by the month at from $8 to $12, payable at the end of the month. Yearly wages are from $100 to $125, payable as needed or when due. Daily wages are from 50 to 75 cents and $1, payable at the end of the day or week. Board is included usually with monthly and yearly wages. Women receive lower wages than men.

34. Are cotton farms worked on shares? On what terms? Are any supplies furnished by the owners?

The share system is prevalent throughout the state, supplies being often furnished by the owner. When the owner furnishes land only, the laborer delivers to him one-third of the crop or one-fourth the cotton and one-third the corn. When supplies, such as teams, implements, seed, etc., are furnished by the owner, the crop is evenly divided. There is but little, if any, deviation from this rule in any of the counties.

35. Does your system give satisfaction? How does it affect the quality of the staple? Does the soil deteriorate or improve under it?

With but few exceptions the system seems to give satisfaction throughout the state. Nearly all of the replies indicate no material change in quality of staple, but a great deterioration in soils. In some an improvement in both staple and soil is noted. (1) *Lake:* Makes staple trashy, and leaves soil foul and hard to cultivate. (19) *Dyer:* Change in soil depends upon the attention of the owner. (29) *Shelby:* Poor cultivation makes poor staple, and *vice versa.* (43) *Hardeman:* A disadvantage to staple; with hired labor the owner can direct how and when to gather. (44) *Hardeman:* Whites lose by farming on shares. Negroes are unwilling to manure the land because of extra work. (110, 111) *McNairy:* Staple injured by careless and late picking; hilly land deteriorates, level land does not. (172) *Rutherford:* Staple not so good nor lint so clean as when by hired labor under control of owner. Most negroes are averse to hiring for wages, because of an idea that croppers have greater privileges. (192) *Sumner:* Satisfaction given unless negroes get too many orders for dry goods and groceries.

36. Which system (wages or share) is the better for the laborer?

The advocates for shares and wages are about equally divided in number. Their reasons may be summed up as follows:

SHARES: In the end brings him twice the amount of money. He gets some hogs and cattle of his own, if at all thrifty; is interested, does more, and does it better. The incentive to work is greater. With good judgment and a family he does best on shares, because the children, 10 to 15 years old, are just as efficient with the cotton hoe and as pickers as a German worth $20 per month if the father and mother will attend to them. He has a home where he can raise his own supplies, is more independent, and a better citizen. They are too much inclined to spend their wages.

WAGES: Runs no risk and makes more money. He gets his money, spends it, and don't conclude that he has been swindled because he has no money at the end of the year. Because of his disposition to neglect the crop when not under control he is kept at work, and avoids temptation to crime and vice. He gets the benefit of the owner's experience and direction, and pays cash for supplies, and at cheaper rates.

37. What is the condition of the laborers? What proportion of negro laborers own land, or the houses in which they live?

The condition of the laborer throughout the state is generally either good or moderately so, especially among the industrious classes; and though often "poor" and dependent, but few are in actual want.

A very small part of the negroes own land, or even the houses in which they live.

(67) *Crockett:* They are mostly self-sustaining. In this part of the county the more thrifty colored people, those who own horses and mules and have their own provisions, as a general thing are renters. They pay so much rent and run the farms themselves. The share croppers, as a general rule, are those who own no stock; have no provisions at all, or only in part. This class does not make much advance.

38. What is the market value of the land described in your region? What rent is paid for such land?

The prices naturally vary very greatly, according to amount of improvements. In the alluvial region of the Mississippi, from $5 to $50, and rents from $3 to $5 per acre. In the counties of West Tennessee and valley of the Tennessee, from $5 to $25, and rents from $3 to $5 per acre. On the Highland Rim they are valued at $15, $20, and $60, and rent for $5 per acre. In the Central Basin prices vary from $5 and $10 to $40, $50, and even $100 per acre; rents, from $1 to $5 per acre. In the valley of East Tennessee, values from $5 to $50 per acre.

39. How many acres, or 400-pound bales, per "hand" is your customary estimate?

On Mississippi river alluvial lands, 10 acres and 10 bales; sometimes much more is made. On the uplands of the rest of the state the usual estimate and average is about 4 bales with other crops, or 6 or 8 bales if cotton alone is planted.

40. To what extent does the system of credits or advances upon the growing cotton crop prevail in your region?

It prevails to a considerable extent throughout the state (often to three-fourths the value of the crop), except in the counties of *Madison, Henry, Benton, Hickman, Lincoln, Moore, Marshall, Williamson, Davidson,* and *Polk,* where but a small portion of the laborers require advances, unless it be improvident negroes. (11) *Lauderdale* and (24) *Tipton:* To negroes and small farmers; the former are supplied usually by the employer or on their own responsibility. (28) *Tipton:* It has been general, but we are having better times, and the people are getting out of debt and are more self-sustaining. (29) *Shelby:* All share hands go on credit; their crops are consumed before made. Improvidence, idleness, and whisky does this, and landlords are compelled to advance to them from the beginning. (46) *Haywood:* Has prevailed to a great extent; more cash in the county now and credit not so much desired. (108) *McNairy:* The owner of the land gets a lien on the growing crop for supplies furnished. (132) *Franklin:* It is the custom of merchants to advance supplies to two-thirds the value of the growing crop. (168) *Williamson:* It is usual to let the negro laborer have enough to clothe and feed him comfortably; with whites, but little required. (172) *Rutherford:* Since 1875 the system has been greatly curtailed. The loss of credit resulting from a series of poor crops from 1872 to 1876, and the financial troubles of those years, have had an excellent effect upon the management of farm affairs.

41. At what stage of its production is the cotton crop usually covered by insurance? Is such practice general?

Cotton is not insured until ready for shipment and at the depot.

(76) *Weakley:* All the crop is not usually covered by insurance. (108) *McNairy:* As soon as planted, if there are debts over the laborer.

42. What are the merchants' commissions and charges for storing, handling, shipping, insurance, etc., to which your crop is subject? What is the total amount of these charges against the farmer per pound, or 400-pound bale?

Commissions, 2½ per cent. Shipping, 25 cents per bale. Storage per month, 50 cents in Memphis and 25 cents per bale in Jackson and other places. Drayage, 25 cents per bale. Weighing, 10 cents per bale. The total cost is, with transportation, from $3 to $5 per bale, or three-fourths to 1 cent per pound. Cotton is, however, mostly sold from the wagon to merchants at home and these costs avoided. (9) *Lauderdale:* Fire insurance, 0.2 per cent.; river insurance, 0.4 per cent. per month. Total, five-eighths cent to Memphis and Saint Louis, three-fourths cent to New Orleans, if sold soon; if kept longer, insurance is added. (21) *Dyer:* 0.75 per cent. marine insurance; 1 per cent. fire insurance; total, including freight, etc., $5 82 per bale, as shown by my accounts. It will average $5. (59) *Madison:* Railroad and fire insurance, each 0.25 per cent. Total charges per bale to New Orleans, $6 to $7. (105) *McNairy:* Mobile merchants handle and pay freight at a cost of about 1 cent per pound. (177) *Rutherford:* 2 pounds dockage per bale; insurance, 28 cents.

43. What is your estimate of the cost of production in your region, exclusive of such charges and with fair soil and management?

The usual estimate is from 7 to 10 cents per pound; a few correspondents place it higher, others much lower. Some probably include all charges.

(14, 16) *Lauderdale,* (78) *Weakley,* (178) *Rutherford:* 2½ to 3 cents per pound. (2, 7) *Lake,* (8, 18) *Lauderdale,* (25) *Tipton,* (31) *Shelby,* (67) *Crockett,* (75) *Weakley,* (84) *Henry,* (96) *Henderson,* (113, 114, 116) *Benton,* (117, 123) *Decatur,* (146) *Giles,* (151, 152, 153) *Bedford,* (162) *Maury,* (167) *Williamson,* (171, 177) *Rutherford,* (187) *Davidson:* 4 to 5 cents per pound. A few estimate it at 6 cents per pound.

(51) *Haywood:* About $15 to $19 to make a bale of cotton, and about $5 to $6 to cultivate an acre of corn. (115) *Benton:* A good hand will make and gather 4 bales for about $80. (116) *Benton:* The cost of producing 800 pounds of seed-cotton (yield of one acre), including wear of land, taxes, wear of tools, labor, etc., is about $8, which, at 2½ cents per pound for seed-cotton, leaves a profit of $12 per acre. If the land were manured the profit would be greater.

COST OF EACH ITEM OF LABOR AND MATERIAL EXPENDED IN THE CULTIVATION OF AN ACRE OF COTTON.

Items.	J. L. Lea, Lauderdale county.	R. L. Halliburton, Lauderdale county.	A. L. Pearson, Fayette county.	Aaron Walker, Haywood county.	A. D. Hurt, Madison county.	W. C. Trice, Henderson county.	W. D. King, Humphreys county.	J. F. Anderson, Franklin county.	T. O. Abernathy, Giles county.	Rev. M. F. Thompson, Bedford county.	B. F. Jarrell, Bedford county.
Total	$16 90	$11 15	$13 83	$8 65	$13 76	$14 12	$4 05	$9 10	$10 95	$12 20	$11 03
Rent	6 00	4 00	2 75	4 00	.....	4 00	3 00	4 50	5 00	3 00	5 00
Fencing, repairs, and interest on	50	25	1 00	25	25	04	.....	.....	51	1 75	50
Knocking stalks	20	10	10	.....	10	05	05	.....	10	10	.....
Bulling and burning stalks	00	.....	.....	.....	.....	.....	05	20	.....	.....	.....
Other cleaning up	.....	10	21	.....	.....	05	.....	.....	10	.....	10
Listing	50	35	.....	.....	25	.....	.....		20	.....	14
Breaking up	.....	20	1 25	00	.....	1 00	75		.....	1 00	.....
Harrowing	.....	15	25	.....	.....	20	10		10	10	.....
Barring off beds	.....	.....	.....	.....	.....	20	.....	1 00	.....	.....	.....
Splitting middles	50	15	21	.....	13	20	.....		20	.....	25
Reversing	75	.....	42	.....	.....	.....	.....		.....	.....	.....
Laying off	35	17	10	.....	13	20	10		10	20	07
Manuring, home-made	.....	.....	.....	.....	5 00	.....	.....		.....	.....	.....
Applying manures	.....	.....	.....	.....	1 00	2 50	.....	1 00	.....	.....	.....
Bedding up	.....	.....	.....	50	50	1 00	.....		.....	80	.....
Splitting middles	.....	15	.....	.....	.....	.....	.....		.....	.....	.....
Knocking off beds	20	.....	.....	10	.....	20	.....		.....	.....	.....
Planting:											
Opening	20	10	10	15		33	.....	45	10	20	12
Dropping	15	13	13	.....	1 00	.....	.....		09	10	08
Covering	20	05	11	.....		.....	.....		10	15	12
Seed	40	20	30	20	30	25	.....	20	30	30	15
Thinning	00	75	75	1 00	50	1 25	.....	50	.....	.....	50
Number of plowings	2 75	3 00	1 50	1 35	3 00	40	.....	50	1 40	2 00	1 25
Number of hoeings	2 25	.....	2 50	.....	1 50	50	.....	50	1 10	1 50	2 25
Hauling to gin	75	30	75	50	10	75	.....	25	05	1 00	50
Management	.....	1 00	1 40	.....	.....	1 00	.....	.....	1 50	.....	.....
Not included in the above estimate:											
Picking, per hundred-weight	75	60	75	50	50	60	.....	45	50	50	50
Ginning, per hundred-weight	1 00	18	70	1 00	60	23	.....	40	22	20	20

REMARKS.—*J. L. Lea:* Cost of cultivating an acre of cotton, including team, feed, and tools, is about $8. Some was cultivated at $6. Average yield over half a bale of 500 pounds lint per acre. Cultivation of cotton has increased a little in ten years in excess of the amount of new clearing. *A. L. Pearson:* The original cost of fencing is about $2 50 per acre. The above estimate is on the basis of one-half bale of 500 pounds lint per acre and a selling price of 10½ cents per pound. The cultivation of cotton has increased in average and amount produced, owing to a vast increase of the number of white laborers entering the field.

NOTE

ON THE

COTTON PRODUCTION OF THE STATE OF KENTUCKY.

TABLE I.—AREA, POPULATION, AND COTTON PRODUCTION OF THE COTTON-PRODUCING COUNTIES OF KENTUCKY.

Cotton counties.	Land area.	POPULATION.						TILLED LAND.		COTTON PRODUCTION.					Cotton acreage per square mile.
		Total.	Male.	Female.	White.	Colored.	Average per square mile.	Acres.	Per cent. of area.	Acres.	Bales.	Product per acre.			
												Bale.	Seed-cotton.	Lint.	
	Sq. mls.												*Lbs.*	*Lbs.*	
Total for entire State	40,000	1,648,690	832,590	816,100	1,377,179	271,511	41.2	8,367,910	32.7	.....	.....	.....	.....	.....	.....
Total for cotton counties	13,910	655,557	329,349	326,208	546,575	108,982	47.1	3,036,894	34.1	2,667	1,367	0.51	729	243	0.2
CHIEF COTTON-PRODUCING COUNTIES.															
Calloway	450	18,295	9,617	8,678	12,080	1,215	29.5	75,450	26.2	316	165	0.52	744	248	0.7
Graves	590	24,138	12,359	11,779	21,287	2,851	40.9	143,037	37.9	869	417	0.48	684	228	1.5
Hickman	240	10,651	5,433	5,218	8,687	1,964	44.3	62,952	41.0	451	254	0.56	804	268	1.9
Fulton	200	7,977	4,076	3,901	6,371	1,603	39.9	43,584	34.0	549	300	0.55	780	260	2.7
Total	1,480	56,061	28,485	27,576	48,425	7,636	37.9	325,023	34.3	2,185	1,136	0.52	741	247	1.5
OTHER COTTON-PRODUCING COUNTIES.															
Allen	300	12,089	6,125	5,964	11,020	1,069	40.3	68,876	35.9	3	2	0.67	951	317	.....
Ballard	420	14,378	7,524	6,854	12,653	1,725	34.2	95,300	35.5	31	15	0.48	690	230	0.1
Barren	500	22,321	11,295	11,026	17,380	4,941	44.6	140,420	43.9	16	7	0.44	624	208	.....
Bell	190	6,055	3,073	2,982	5,874	181	31.9	24,480	20.1	2	1	0.50	714	238	.....
Bracken	200	13,509	6,966	6,543	12,693	816	67.5	88,716	69.3	10	5	0.50	714	238	0.1
Butler	370	12,181	6,163	6,018	11,361	820	32.9	76,280	32.2	2	1	0.50	714	238	.....
Christian	590	31,082	16,144	15,538	17,043	14,039	53.7	190,651	50.4	2	1	0.50	714	238	.....
Crittenden	420	11,688	5,966	5,782	10,537	1,151	27.8	77,265	28.7	11	4	0.36	519	173	.....
Daviess	450	27,730	14,230	13,500	22,876	4,854	61.6	154,698	53.7	8	9	1.13	1,602	534	.....
Edmonson	280	7,222	3,637	3,585	6,667	555	25.8	43,965	24.5	8	4	0.50	714	238	.....
Estill	300	9,860	4,989	4,871	9,349	511	32.8	35,765	18.6	8	2	0.25	357	119	.....
Floyd	500	10,176	5,112	5,064	9,977	199	20.4	40,068	12.5	12	2	0.17	237	79	.....
Green	300	11,871	5,986	5,885	9,463	2,408	39.6	70,885	36.9	2	1	0.50	714	238	.....
Henderson	450	24,515	12,646	11,869	16,943	7,572	54.4	135,223	47.0	21	9	0.43	612	204	.....
Jefferson	430	146,010	70,685	75,325	120,408	25,602	339.6	143,267	52.1	110	48	0.44	621	207	0.3
Laurel	620	9,131	4,595	4,536	8,864	267	14.7	48,140	12.1	3	1	0.33	474	158	.....
Letcher	300	6,601	3,403	3,198	6,459	142	22.0	28,561	14.9	2	2	1.00	1,425	475	.....
Livingston	280	9,165	4,672	4,493	8,130	1,035	32.7	69,465	38.8	2	1	0.50	714	238	.....
Logan	590	24,358	12,262	12,096	16,977	7,381	41.3	173,987	46.1	22	11	0.50	714	238	.....
McCracken	330	16,262	8,035	8,227	11,878	4,384	49.3	42,901	20.3	33	18	0.55	777	259	0.1
Magoffin	300	6,944	3,540	3,404	6,794	150	23.1	35,915	18.7	4	4	1.00	1,425	475	.....
Marshall	350	9,647	4,870	4,777	9,207	440	27.6	59,306	26.5	23	10	0.43	621	207	0.1
Muhlenburgh	600	15,098	7,738	7,360	13,020	2,078	25.2	78,655	20.5	4	4	1.00	1,425	475	.....
Pendleton	400	16,702	8,580	8,122	15,922	780	41.8	89,637	35.0	12	9	0.75	1,068	356	.....
Pike	140	13,001	6,696	6,305	12,826	175	92.9	46,812	52.2	16	9	0.56	801	267	0.1
Pulaski	120	21,318	10,733	10,585	20,122	1,196	177.7	118,027	153.7	2	1	0.50	714	238	.....
Simpson	400	10,041	5,356	5,285	7,844	2,797	26.6	74,880	29.2	5	3	0.60	855	285	.....
Trigg	420	14,489	7,392	7,097	10,449	4,040	34.5	99,822	37.1	8	6	0.75	1,068	356	.....
Trimble	150	7,171	3,727	3,444	6,594	577	47.8	33,112	34.5	30	15	0.50	714	238	0.2
Warren	550	27,631	13,783	13,748	19,892	7,639	50.1	164,033	46.6	31	10	0.32	450	153	0.1
Wayne	430	12,512	6,156	6,356	11,613	899	29.1	81,013	29.4	36	14	0.39	555	185	0.1
Whitley	560	12,000	6,019	5,981	11,752	248	21.4	51,236	14.3	1	1	1.00	1,425	475	.....
Wolfe	190	5,638	2,826	2,812	5,563	75	29.7	30,510	25.1	2	1	0.50	714	238	.....
Total	12,430	599,496	300,864	298,632	498,150	101,346	48.2	2,711,871	34.1	482	231	0.48	684	228	.....

TABLE II.—ACREAGE AND PRODUCTION OF THE LEADING CROPS IN THE COTTON COUNTIES OF KENTUCKY.

Counties.	COTTON.		INDIAN CORN.		OATS.		WHEAT.		TOBACCO.	
	Acres.	Bales.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Pounds.
Total for entire State	2,667	1,367	3,021,176	72,852,263	403,416	4,580,738	1,160,108	11,356,113	226,120	171,120,784
Total for cotton counties	2,667	1,367	1,182,506	25,955,700	156,684	1,730,481	420,088	3,436,448	124,477	91,794,750
CHIEF COTTON-PRODUCING COUNTIES.										
Calloway	316	165	35,209	780,839	3,420	33,050	8,076	47,890	5,035	3,477,520
Graves	869	417	59,359	1,540,245	4,546	52,876	23,379	147,925	11,318	8,901,434
Hickman	451	254	28,302	784,828	889	13,857	14,296	107,006	658	461,946
Fulton	549	300	19,755	617,202	631	10,835	10,978	93,795	537	410,397
Total	2,185	1,136	142,631	3,723,114	9,486	110,618	56,729	396,616	17,548	13,251,237
OTHER COTTON-PRODUCING COUNTIES.										
Allen	3	2	31,578	401,279	6,369	56,821	10,505	46,848	283	160,355
Ballard	31	15	36,851	951,357	1,626	20,982	21,166	161,843	5,195	3,760,749
Barren	16	7	50,201	850,338	13,887	150,904	17,819	119,775	3,120	2,305,586
Bell	2	1	11,558	201,777	1,521	11,091	518	2,784	24	4,567
Bracken	10	5	21,025	562,550	705	9,715	13,435	179,979	7,159	6,126,035
Butler	2	1	34,579	651,593	7,271	88,583	5,860	32,513	1,652	1,030,029
Christian	2	1	60,724	1,430,154	4,981	64,341	40,247	437,668	18,475	12,577,574
Crittenden	11	4	37,706	848,900	3,608	37,022	7,295	48,221	2,368	1,047,936
Daviess	8	9	53,321	1,392,599	5,678	79,946	13,813	147,303	12,260	9,523,451
Edmonson	8	4	19,682	328,159	1,733	13,657	4,649	22,858	727	450,076
Estill	8	2	19,459	397,952	1,340	10,827	3,400	22,617	58	18,380
Floyd	12	2	21,351	429,298	2,501	15,072	2,750	18,356	73	13,845
Green	2	1	29,665	411,278	3,279	24,843	8,672	57,557	2,345	1,417,070
Henderson	21	9	55,038	1,680,007	1,781	27,589	9,832	124,991	12,468	10,312,631
Jefferson	110	48	38,757	1,056,209	8,056	114,793	15,825	186,212	26	11,632
Laurel	3	1	17,982	278,074	3,933	26,378	4,559	22,525	68	23,202
Letcher	2	2	11,175	215,547	1,141	8,804	1,640	10,622	23	2,907
Livingston	2	1	29,661	740,746	2,469	29,072	7,298	62,465	1,127	709,578
Logan	22	11	54,988	1,181,699	8,932	130,059	36,893	340,262	8,104	6,030,983
McCracken	33	18	20,542	483,776	2,856	30,677	8,814	64,549	3,377	2,419,825
Magoffin	4	4	13,751	267,726	3,004	20,643	2,186	14,801	73	11,464
Marshall	23	10	28,379	902,913	3,410	32,014	9,706	47,755	2,085	1,411,692
Muhlenburgh	4	4	35,798	652,279	7,814	100,340	9,688	63,874	3,856	2,731,716
Pendleton	12	9	28,813	792,695	1,636	20,696	14,740	181,845	5,302	4,072,291
Pike	16	9	26,505	543,463	3,402	24,186	3,059	18,207	100	18,048
Pulaski	2	1	42,355	612,388	11,136	76,159	16,267	80,636	100	30,516
Simpson	5	3	29,778	579,055	6,132	86,709	18,267	117,010	2,240	1,608,055
Trigg	8	6	32,919	796,954	1,319	14,879	9,789	94,516	8,481	5,667,143
Trimble	30	15	13,135	281,183	2,199	25,390	5,505	66,027	2,070	1,658,307
Warren	31	10	67,177	1,495,419	14,448	204,000	21,173	150,750	3,505	2,605,388
Wayne	36	14	27,774	462,894	3,285	24,127	10,943	59,574	50	20,264
Whitley	1	1	24,802	390,429	3,001	20,417	4,472	17,054	10	3,498
Wolfe	2	1	12,756	261,896	2,745	18,518	2,514	16,935	50	29,520
Total	482	231	1,039,875	22,282,586	147,198	1,619,863	363,359	3,039,832	106,929	78,543,513

COTTON PRODUCTION IN KENTUCKY.

Excepting a narrow strip of country in the western part of the state contiguous to Tennessee, Kentucky is hardly entitled to notice as a cotton-producing region. Tobacco takes the place of cotton, and is a leading crop, and even the area excepted might be claimed as naturally a part of Tennessee. This area lies between the Mississippi and the Tennessee rivers, in Fulton and the southern parts of Hickman, Graves, and Calloway counties, in an offset made at the expense of the sister state of Tennessee by the abrupt dropping southward between the rivers of the line separating the two states. Indeed, if, after reaching the Tennessee river in its course from the east, the boundary-line had continued directly on to the Mississippi, the cotton-producing strip would be a part of Tennessee and the latter state would have no notch in its northwestern corner to mar its symmetry. An inspection of the acreage map will show how this is. The relative importance of the fraction referred to as an area contributing to the total cotton product of Kentucky in 1879 is strikingly brought out when it is stated that of the total for the state, 1,367 bales, 1,136 were raised within this area, leaving only 231 to be accounted for. This strip indeed is the extreme northern limit of the cotton region in the eastern part of the Mississippi valley, the whole state of Kentucky, excepting this small fraction, being thrown into the penumbral region of cotton culture.

The entire area in Kentucky between the Mississippi and the Tennessee rivers, containing about 2,500 square miles, with an elevation above the sea of 280 feet along the river bottoms and 350 to 450 feet on the uplands, is based on strata of sands, calcareo-silice us and loamy earths, with limited beds of clay and gravel, all but little consolidated, and belonging to geological formations (the uplands Quaternary and the lowlands "Recent") of comparatively modern age. These strata may be called "soft rocks", the Tennessee river being their eastern limit. Beyond this very different strata abruptly set in, "hard rocks" of solid limestone and other kinds, members chiefly of the far older sub-Carboniferous division of geologists.

The area in Kentucky between the rivers is but the northern end of a great belt of country, famous for its mellow, rich lands and as a cotton-producing region, that lies immediately east of the Mississippi river, mainly in the states of Mississippi and Tennessee. The belt begins on the west with the alluvial bottoms of the Mississippi (1 on the agricultural map). Proceeding eastward, and crossing the bottoms at any point, we are suddenly confronted with a bold, steep escarpment, or the "bluff", which, like a wall, reaches from southern Mississippi, through Tennessee, far into Kentucky. The bluff is touched by the Mississippi river at but few points: in Tennessee, at Memphis, Randolph, and Fulton; in Kentucky, at Hickman and Columbus. Ascending to the top of the bluff, 100 to 200 feet or more above the bottoms, we find ourselves upon a plateau country (2-6 on the agricultural map) which extends eastward for a long distance. This plateau country is the greater part of the belt. Its surface in Tennessee is divided longitudinally into three long sections or smaller belts: one on the west, with the bluff as its western limit; another to the east, rising up into a dividing summit between the waters of the Mississippi and the Tennessee rivers; and a third intermediate and wider one. These sections extend into Kentucky with their characteristic strata and soils, the western and middle (2 and 3 on the map) the more extensively. The western section is from 10 to 30 miles wide. Its soils are based upon a remarkable bed of very fine siliceous earth, containing more or less calcareous matter, and called, in the language of geologists, *loess*. There is much of this formation in Fulton, Hickman, Ballard, and other counties in the part of Kentucky west of the Tennessee river. The middle section or sub-belt has in Tennessee brown, loamy, mellow soils, based on sandy strata, fertile and important, which also occur in Kentucky. These, with the soils of the loess, spread over the region between the rivers, and together make the warm lands—of easy tillage, highly productive of tobacco, and enticing cotton culture, in spite of climate—within their area. The loess of this region is thus spoken of by D. D. Owen in one of his first reports on the geology of Kentucky:

> The most conspicuous and frequently occurring beds of the Quaternary is a very fine calcareo-siliceous earth of pale reddish-gray or ashen-flesh tint. This imparts character to the soil where the Quaternary formations exist more frequently than any of the other

beds, and it gives rise to some of the best tobacco land. Its usual constituents may be seen from the following chemical analysis of a specimen taken from the great cut of the Mobile and Ohio Railroad near Columbus, in Hickman county:

	Per cent.
Combined moisture	1.35
Organic matter soluble in water	0.30
Insoluble silicates	73.30
Carbonic acid	10.00
Lime	6.80
Magnesia	3.78
Alumina and peroxide of iron	2.80
Chlorine	0.12
Loss, and alkalies not determined	1.55
	100.00

Analysis of the insoluble silicates.

	Per cent.
Silica	60.6
Alumina	7.4
Lime	1.1
Magnesia	0.4
Loss, alkalies and trace of iron not estimated	3.8
	73.3

Its calcareous matter is derived, in a great measure, from the land and fresh-water shells, often abundantly disseminated through it, sometimes in a good state of preservation, but oftener in a very soft and tender condition, so that they crumble to pieces as soon as touched. Calcareous concretions are not unfrequently disseminated through this earth in considerable abundance, formed by the percolation of water charged with carbonic acid, which, dissolving the calcareous matter in the upper part of the deposit, carries it by filtration to the lower part of the bed, redepositing it in the form of hard masses, which not unfrequently envelop the same shells in a very perfect condition. This is also the most superficial bed of the Quaternary deposits, as it is generally reached immediately after passing through the subsoil. It has a thickness of from 30 to 40 feet, and rests generally in southwestern Kentucky on gravel chiefly composed of brown hornstone and chert, derived from the sub-Carboniferous strata.

The reader, desiring further information as to loess soils, is referred to the report on Mississippi, in which there is a discussion of them by Professor Hilgard.

The alluvial belt of the Mississippi river supplies fine areas of tillable lands, in some parts of which, in Fulton county especially, cotton is cultivated to a greater or less extent. Such are the lands of Madrid Bend and the "front-lands", extending for miles along the river from the town of Hickman to the Tennessee line. Cotton, however, is chiefly raised upon the uplands.

Table I gives the population and the cotton production of the counties designated as cotton-producing, and in which, substantially, the cotton reported as the yield of the state in 1879 was raised. Their total product is 1,136 bales of 475 pounds each. The yield per acre is high—0.52 per cent. of a 475-pound bale, or 741 pounds of seed-cotton. The increase in total products over that of 1869 is, after making the proper reduction, 67½ per cent. The negroes form about 14 per cent. of the total population.

Of the other counties in the Quaternary region, Ballard produced, in 1879, 15 bales; McCracken, 18; and Marshall, 10; making for the entire region 1,179 bales, and leaving only 188 bales for the remainder of the state.

In the counties east of the Tennessee river the cotton patches of 1879 were scattered in a remarkable manner over its area, as may be seen on the acreage map. Some of them occupy anomalous positions. One occurs in Bracken county and two in Trimble county, in the northern part of the state, and not far from Cincinnati. Jefferson reports a product of no less than 48 bales. Thirty-one counties east of the Tennessee produced varying amounts, none reporting less than a bale being included.

With such a scanty product of cotton as we have in this part of Kentucky, any discussion of the soils with reference to cotton-growing would not be pertinent, and could have no practical bearing. It is especially in relation to tobacco-growing that such discussions would be in place.

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